

AN EMPIRICAL ANALYSIS OF LOW INCOME HOUSING
TAX INCENTIVES

By

ALAN BRUCE CLEMENTS, B.S., M.B.A.

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Alan Bruce Clements

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Alan Bruce Clements

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The U.S. tax laws have consistently been utilized by the Congress of the United States as a policy tool to stimulate investment in various activities deemed socially, economically or politically desirable. In particular, the real estate industry in the United States has been a frequent recipient of such tax preferences. The primary objective of this research was to examine the economic effect of tax preferences provided to investors in privately developed low income housing over the period 1970-1985.

Two economic models were developed to address this issue. First, an internal rate of return model was constructed and applied to representative low income housing projects, in order to develop estimates of rates of return available to investors in such projects over the test period of the study. These quarterly returns were then dichotomized into tax and

non-tax components, and utilized as separate independent variables in a multiple regression model to assess their investment effects, over the same time period. In addition, two other independent variables were included in the regression analysis, the level of direct governmental subsidy provided to low income housing investors and the rate of return available on a low-risk asset. The dependent variable examined was the number of units of privately developed, federally subsidized low income housing started during each quarter of the test period.

The conclusions of the study were

1. No significant association was found between tax preferences provided to low income housing investors and the number of units of low income housing started during the test period.

2. Limited evidence was available to support an association between tax incentives and low income housing starts in the presence of direct governmental subsidies.

3. A significant negative relationship was indicated between the number of units of low income housing started during the test period and the rate of return from a low-risk asset.

CHAPTER I INTRODUCTION AND SCOPE

Introduction

The United States Congress has consistently utilized the federal income tax system as a policy tool to influence the investment behavior of taxpayers. In particular, certain segments of the economy (e.g., business equipment, real estate, etc.) have received substantial benefits from income tax preferences such as special tax deductions or credits, which act to lower the tax liability of investors in these activities. To date, most of the empirical research examining the incentive effects of tax laws has focused on the economic impact of tax subsidies on firms' investment decisions as they relate to the investment tax credit (ITC). The effect of tax subsidies on investor behavior in a separate and important economic market, real estate, has received little empirical attention from researchers. The purpose of this study is to extend the empirical analysis of tax-related behavior to the real estate market, and in particular, to investments in low income housing.¹ Specifically, the primary issue addressed in this study is the relationship between low income housing tax subsidies and investment behavior.

This chapter includes a discussion of the use of tax incentives by Congress, including supporting and critical arguments. In addition, this chapter provides an overview of the tax treatment of low income housing investments over the period 1970-1988. The remainder of the chapter includes a discussion of the research issues and research questions addressed in the study, the research methodology used to examine the research questions, prior related research and a summary of subsequent chapters.

Background Information

Nature of Federal Tax Policy

Since the origination of the federal tax system, taxes have occupied a prominent role in the pursuit of various economic, social, and political objectives of the federal government. Although designed primarily as a revenue generating mechanism to fund governmental activities and services, the tax system has been increasingly utilized as a policy tool (i.e., a disincentive for certain activities [e.g., consumption taxes on liquor and tobacco] and an incentive mechanism for other activities [e.g., investment tax credit, accelerated depreciation deduction, and charitable contributions deduction]), either to support certain socially or politically desirable activities or to provide a stimulus to the overall economy.

Tax incentives over time have varied in design and have taken the form of tax deductions (e.g., accelerated

depreciation), income exclusions (e.g., municipal bond income), income deferrals (e.g., unrealized capital gains), preferential tax rates (e.g., capital gains) or tax credits (e.g., investment tax credit), all with the goal of reducing the cost of the supported activity or its risk [Surrey, 1969].

Arguments Supporting the Use of Tax Incentives

A substantial body of economic literature supports the use of Pigouvian tax subsidies² to correct positive externalities.³ In cases where large numbers of individuals are affected, the private market solution may be economically infeasible, due to excessive information costs, administrative costs, and the existence of a free-rider problem. In such cases, government intervention is mandated to correct the externality [Gravelle, 1980].

The increased use of tax incentives by the federal government, as compared to direct subsidies, may be attributed to several factors, including their "psychological" attractiveness as compared to direct subsidies, their perceived lower cost of administration and the perceived benefits of private vs. public initiation of the subsidized activity [Surrey, 1969]. Politically, tax incentives may be favored over direct subsidies due to the federal budgetary process, which does not require a direct budgetary appropriation for tax incentives although the revenue "cost" of the incentive must be reported as a tax expenditure.⁴

Arguments Against the Use of Tax Incentives

The primary criticisms of tax incentives are based on the economic and social principles of equity and efficiency. Tax incentives represent only one means to support desired economic behavior. Alternative incentives include grants, loan guarantees, and interest subsidies. In general, the use of government tax subsidies to promote a desired activity may be inefficient in comparison to a private market solution (e.g., bargaining) or alternative government responses (e.g., direct cash payments or in-kind subsidies). Also, the efficient provision of a subsidy requires the incurrence of certain information and administrative costs, which may render the subsidy cost-inefficient.

The use of tax incentives has been criticized on the basis that their use may create (1) tax inefficiencies, due to subsidization of activities which would be undertaken under normal market conditions, or displacement of non-subsidized activities [Murray, 1983]; (2) tax inequities, since most tax incentives are utilized by taxpayers having higher marginal tax rates, which reduces the progressivity and thus the vertical equity of the tax system, and (3) increased tax rates, since the provision of tax incentives reduces the tax base, thereby creating the need for higher tax rates to support revenue requirements, or equivalently, a higher federal deficit [Surrey, 1969]. The use of tax incentives may also weaken public perception of the fairness of the tax

system, if higher income taxpayers are viewed as the main beneficiaries of such incentives [Jackson and Milliron, 1986]. Given a tax system based largely on voluntary compliance, if such compliance is weakened as a result of perceived inequities in the system, excessive use of tax incentives may ultimately reduce tax revenues.

Potential Effects of Tax Incentives

The economic rationale supporting tax incentives is relatively basic, as depicted in Figure 1-1.

1.

TAX CHANGES



2.

RATE OF RETURN
EFFECT



3.

TAXPAYER REACTION

Figure 1-1

Economic Effect of Tax Incentives

The introduction of a tax incentive lowers the after-tax cost of the supported activity, which, in the absence of other economic changes, produces an increased expected rate of return to investors. Basic economic theory would suggest that in a perfect capital market, given a limited pool of investment dollars, a positive change in the expected rate of economic return from a specific activity should produce a

shift of investment capital to the higher return activity, until equilibrium is attained through normal market forces.

In actual (imperfect) economic markets, this response is difficult to prespecify, given the existence of various economic factors (e.g., long-term capital commitments, relationships with other forms of subsidy, and opportunity costs), and potential information constraints⁵, which may interact with the expected return on investment to determine the actual level of investment in a given activity. In addition, the nature of the activity may be such that return effects do not motivate additional investment.

Depending on the particular investment model ascribed to, tax incentives could affect investment spending in different ways. For example, under the accelerator model of investment, the ratio of capital to output is considered fixed, and thus, for each unit of increase in output, the firm increases its investment in capital. Under this model, capital investment is a function of the output level and not the user's cost of capital. Therefore, investment tax incentives which reduce the cost of capital may have no direct effect on investment spending⁶.

Alternatively, under Jorgenson's (1963) neoclassical model, capital investment is treated as a direct function of the firm's cost of capital. Under this model, a decrease in the cost of capital would be expected to produce greater

capital investment by the firm, by increasing the desired level of capital stock [Rosen, 1988].

Given the existence of these and other factors, the implied assumption made by policy makers that rate of return adjustments will motivate specific economic behavior on the part of taxpayers may be open to question.

The effects of investment tax incentives on investment behavior has been examined empirically in numerous studies. Most studies have concluded that federal tax policy does influence investment behavior in the expected direction, although the estimated magnitude of this reaction differs among the various researchers [Chirinko and Eisner, 1983].

The Use of Tax Incentives in Real Estate

Investment tax incentives are pervasive throughout the tax laws. In addition to accelerated depreciation and the ITC, tax incentives have been utilized to support research and development activities, pollution control, oil and gas exploration, and real estate, among others. In particular, real estate has received substantial investment incentives through the tax system, both at the personal and investment levels. These incentives include deferral of the gain on the sale of a personal residence, accelerated depreciation of structures, capital gain treatment on real property dispositions, favorable tax treatment of leverage financing, and special amortization rules for certain construction period costs.

Among the set of potential real property investments, residential rental property has generally received more favorable tax incentives relative to nonresidential rental property, which is presumably due to the higher perceived value of the positive externality created by housing additions as compared to nonresidential construction.⁷ In the Housing Act of 1949, Congress stated as a basic objective "the realization as soon as feasible of the goal of a decent home and suitable living environment for every American family".⁸ In the same act, Congress provided "The policy to be followed in attaining the national housing objective . . . shall be: (1) private enterprise shall be encouraged to serve as large a part of the total need as it can; (2) governmental assistance shall be utilized where feasible to enable private enterprise to serve more of the total need".⁹ This act in essence provided the basis for the legislative use of tax policy as one means to remedy the nation's low income housing problems, specifically by encouraging private producers, through the use of tax incentives, to build housing for low income individuals.

The production of low income housing is thought to provide benefits to society which exceed the private benefits accruing to producers of such housing in the form of returns to capital. Thus, the marginal private return available to producers of low income housing is less than the theoretical value of marginal social return. This produces an economic

inefficiency due to the underproduction of housing units for low income individuals, or the production of substandard housing for such individuals. The marginal private return represents the actual rate of return on investment to producers of low income housing. The actual production level chosen by producers is the point where their marginal return equals the marginal cost of production. From society's perspective, the optimal point of low income housing production would occur at the point where the marginal social return equals the marginal cost of production. This difference in production levels represents an economic inefficiency from society's perspective, necessitating government intervention in some form (e.g., a subsidy) to increase the production level to the optimal level [Rosen, 1988].

The federal government has used various forms of economic subsidies over time to correct the imbalance between demand for low income housing and the quantity provided. This variation in subsidy form can be attributed to changing political administrations and differing economic philosophies. Historically, the primary form of government incentive has been subsidies to support new construction and rehabilitation of low income housing units.¹⁰ Subsidies have been offered to suppliers of low income housing in the form of grants, low interest rate loans, guaranteed loans, and tax incentives.

The Reagan administration reduced or eliminated most expenditures for direct housing subsidies, including most supply type subsidies which were in favor during the late 1960s and 1970s.¹¹ In sharp contrast to that administration's basic philosophy of economic stimulation on the supply-side, testimony by Treasury officials indicate that the tax laws may be no longer viewed as a solution to the nation's housing problem.¹² Effective in 1983, the Reagan administration adopted a rent voucher program, which provides a rent supplement to eligible low income individuals. This program reflects the view held by the Reagan administration that affordability, not availability, is the primary housing problem for low income individuals [National Association of Home Builders, 1986].

The effectiveness and efficiency of such housing programs has generated substantial economic debate. The primary questions appear to be (1) whether demand subsidies (e.g. rent vouchers) or supply subsidies (e.g. tax incentives) are optimal from the perspective of utility and cost in providing housing to low income individuals (see, for example, Sa-Aadu, 1984), and (2) whether provision of investment incentives for housing has significant effects on new housing starts (see, for example, Murray, 1983).

Effective with the Tax Reform Act of 1969, Congress has provided preferential investment incentives for low income housing through the Internal Revenue Code.¹³ The primary

objective of these incentives is to increase the relative rate of return on investment in low income housing projects by lowering the net project cost. Theoretically, such incentives would motivate new investment in low income housing projects, due to the increased after-tax return available to investors.¹⁴

However, a substantial shortage of housing for low income individuals currently exists in the United States. Thus, the success of incentive programs enacted by Congress for low income housing (both direct and indirect incentives) must be questioned. In recent years, Congress has increasingly relied on the use of tax incentives to motivate housing production in the low income sector. The clear issue therefore, is the effect of such incentives on the target activity, low income housing.

Tax Treatment of Low Income Housing Investments: Overview

Investors in low income housing have been eligible to receive preferential tax benefits beginning with the Tax Reform Act of 1969. This act provided for a 5-year recovery period for expenditures to rehabilitate existing low income housing, which is substantially shorter than the 40-year recovery period for equivalent expenditures on other forms of residential rental property. New construction of low income housing received tax benefits similar to other forms of residential rental property.

The Tax Reform Act of 1976 revised the recapture rules relating to depreciation claimed on investments in low income

housing. Prior to this act, the allowable depreciation on low income housing that was in excess of the straight-line amount was recaptured in full as ordinary income if the property was held 20 months or less. This recapture amount was decreased by one percent for each month the property was held in excess of 20 months. Under the Tax Reform Act of 1976, allowable depreciation in excess of the straight-line amount was recaptured in full as ordinary income if the property was held less than 100 months. This recapture amount was decreased by one percent for each month the property was held in excess of 100 months.

The Revenue Act of 1978 increased the capital gains deduction from 50 percent to 60 percent of the net long-term capital gain.

The Economic Recovery Tax Act of 1981 (ERTA) substantially modified the tax treatment of low income housing. First, income tax rates were reduced from a top marginal rate of 70 percent to 50 percent. This effectively reduced the tax rate on net long-term capital gains from 28 percent to 20 percent, for a taxpayer paying taxes at the top marginal tax rate. In addition, ERTA revised the depreciation provisions related to low income housing. Under ERTA, the cost of low income housing could be recovered over a 15-year period, using the 200 percent declining balance depreciation method, compared to the 40-year, straight-line depreciation requirement under pre-ERTA law.

The Tax Reform Act of 1986 (TRA86) altered the tax treatment of low income housing in several important ways. First, the act limited the amount of project losses which could be used to offset unrelated income. Previously there was no limitation on the use of such losses.

Second, the act repealed the exemption from the at-risk rules which real property had previously enjoyed. This provision effectively limits the deduction of investment losses on real property for which the taxpayer is not at risk.

Third, the act reduced the maximum individual tax rate from 50 percent to 28 percent for all sources of income (although a 33 percent rate may apply to certain taxpayers with higher adjusted gross incomes).

Fourth, the act repealed the expensing provision for construction period interest and taxes which low income housing had enjoyed under prior law. Subsequent to the 1986 Tax Reform Act, all such costs must be capitalized and depreciated over the property's useful life.

Fifth, the act required that low income housing costs be recovered over a 27.5 year period, using straight-line depreciation.

Sixth, the act tightened the requirements for receiving tax-exempt financing on low income housing projects.

Seventh, and probably most important, the act instituted a tax credit for investors in low income housing. A 4 percent or 9 percent tax credit (depending on whether the property is

new or used and whether federal subsidies are received related to the property) is available to investors based on the qualified basis of the property, over a ten-year period.

Research Methodology

To estimate the effect of tax incentives on investment behavior, this study adopts a two-part methodology. In the first part, an internal rate of return model is developed which incorporates the effects of operating and tax variables on an investment project's rate of return. This rate of return model is then applied to a standard case low income housing project,¹⁵ the parameters of which are estimated for each quarter of the test period. Rates of return are calculated under varying assumptions for each quarter of the test period 1970-1985.

In the second phase of the study, the number of low income housing units started over each quarter of the test period is regressed on the estimated rate of return variables and the level of direct government subsidy to explain any potential effect of income taxes on the investment decision.

Research Questions

Three research questions were addressed by this study, which are stated as follows:

1. Over the period 1970-1985, what is the effect of federal tax incentives on multifamily, low income housing starts?

A general criticism leveled at the Congress relating to tax incentives to stimulate the production of low income housing is that such incentives are not sufficient to affect low income housing production. In effect, the argument is that direct federal subsidies in addition to tax incentives are necessary to provide a sufficient return to investors which will motivate the construction of additional low income housing units. Accordingly, the second question addressed by this study is stated as follows:

2. Over the period 1970-1985, what is the economic relationship between federal tax incentives for low income housing and direct subsidies for low income housing?

Tax incentives possess value only to the extent that their risk adjusted, after-tax returns exceed those available on alternative investments. This is a critical issue in assessing the impact of tax incentives on a specified activity, since most tax law changes contain a multitude of provisions affecting diverse areas of the economy, potentially at the expense of other tax provisions. This study proposes examination of the effect of returns from an alternative, low-risk investment on the number of units of low income housing started during the test period. The alternative investment utilized in this study is tax-free municipal bonds. Accordingly, the third research question is stated as follows:

3. Over the period 1970-1985, what is the economic relationship between returns available on a low-risk asset and investment in low income housing?

The Internal Rate of Return Model

The IRR model utilized in this study is a variant of that used in Brueggeman et al. [1982] and Fisher et al. [1984]. In this model, the total equity investment is set equal to the present value of future cash flows generated by the project, which consist of operating cash flows, tax benefits, and net proceeds realized on the disposition of the investment. The internal rate of return (K) is the rate which equates these two sets of cash flows. The internal rate of return model is described as follows:

$$\begin{aligned}
 (\text{TPC} - \text{CPT} - \text{PF}) &= \sum_{i=1}^s \frac{(R_i - O_i - \text{IEP}_i - P_i) [+/-] \text{TE}}{(1+K)^i} \\
 &+ \frac{V_s - S_s - B_s - G_s t_{si} - DR_s t_{ol} - \text{LCR}_s}{(1+K)^s}
 \end{aligned}$$

where,

- TPC = total cost of project, including land
 CPT = tax benefit from deduction of construction period interest and property taxes
 PF = project financing
 s = holding period (years)
 R_i = rental income in period i
 O_i = operating expenses in period i
 IEP_i = interest expense (project) in period i

- P_i = principal portion (amortization) of the loan payment in period i
- TE (tax effect) = $f(R_i, O_i, IEP_i, PIT_i, LIC_i, D_i, AGI_i, t_0)$
- PIT_i = passive income of taxpayer (total) in period i
- LIC_i = low income housing investment credit
- D_i = tax depreciation allowed in period i
- AGI_i = adjusted gross income of taxpayer in period i
- t_{oi} = marginal ordinary income tax rate of taxpayer in period i
- V_s = estimated value and selling price of project in year s
- S_s = selling and other transactions costs in year s
- B_s = balance of mortgage in year s
- G_s = capital gain, net of selling costs (S_s), resulting from sale in year s
- t_{gs} = marginal capital gain tax rate of taxpayer in year s
- DR_s = net excess depreciation which is recaptured upon sale in year s
- LCR_s = low income housing investment credit recaptured upon sale in year s
- K = after-tax internal rate of return on equity investment in property held for s years.

Use of Internal Rate of Return Calculations

To isolate the effect of tax incentives on investment return, this study employs a two-step procedure. First, the after-tax internal rate of return (ATIRR) (represented in the model by K) is calculated by inclusion of all operating and tax variables in the return model. This ATIRR is then

dichotomized into a tax-specific return component (TXRT) and a non-tax return component (NTX), by calculating the before-tax internal rate of return. TXRT is then calculated as $[ATIRR - NTX]$.

Test Period

This study uses a test period of 1970-1985, during which time six different tax laws affecting real property investments were enacted. This particular period was chosen for several reasons. First, 1970 was the first year that tax incentives were provided by Congress for low income housing, although these first incentives applied only to the rehabilitation of existing housing. Beginning in 1977, preferential tax incentives were provided for the construction of new low income housing. The final year of the test period is 1985. This date was chosen due to the fact that major tax reform initiatives which led to the Tax Reform Act of 1986 had originated in 1985. These discussions of tax reform, which included major provisions affecting low income housing, would be expected to have increased investor uncertainty relating to potential benefits and costs of investment, and thus would confound the issue of interest in this study. Thus, the years 1985-1986 were viewed primarily as transitional, and thus not meaningful for purposes of this study.

The Regression Model

The second part of this study examines the relationship between tax incentives and low income housing investment

behavior. No direct theoretical or empirical evidence exists which addresses the functional form of low income housing investment decisions, other than basic economic theory, which postulates that additional investment will result from an increased rate of return in a given activity, *ceteris paribus*. This study utilizes a rate of return measure as the primary factor in the low income housing investment decision, the nature of which is described below.

The level of investment in low income housing, represented by the number of quarterly starts of privately initiated, subsidized multifamily housing for a particular period is posited to be a linear function of (1) tax benefits (TXRT) (2) non-tax investment returns, exclusive of tax benefits (NTX), (3) the level of direct government subsidy for the investment period (DSUB), and (4) the return available on an alternative, relatively risk-free investment (ALRT). The functional form of this model is described as follows:

$$\begin{aligned} \text{STRT}_t = & \beta_0 + \beta_1(\text{TXRT}_{t-2}) + \beta_2(\text{NTX}_{t-2}) + \beta_3(\text{DSUB}_t) + \\ & + \beta_4(\text{DSUB}_t)(\text{TXRT}_{t-2}) + \beta_5(\text{ALRT}_{t-2}) + \epsilon \end{aligned}$$

where,

- | | | |
|---------------------|---|--|
| STRT_t | = | number of multifamily subsidized housing starts during period t . |
| TXRT_{t-2} | = | tax effect component of internal rate of return on investment in low income housing for period $t-2$. |
| NTX_{t-2} | = | non-tax component of internal rate of return on investment in low income housing for period $t-2$. |
| DSUB_t | = | level of direct subsidy provided to multifamily subsidized housing for year t . |

- ALRT_{t-2} = average return available on tax-free, long-term
Aaa municipal bonds for period t-2.
- ϵ = error term with zero expected value and zero
correlation with the explanatory variables.
- β_0 = intercept term
- β_i = parameter estimates ($i = 1$ to 5)

Research Limitations

Several points concerning the assumptions used in this study to model the behavioral effect of changes in tax laws deserve mention. First, the value of tax benefits is assumed to be measurable by their effect on the internal rate of return, as opposed to other return measures. Given the widespread use of internal rate of return in the real estate industry, this does not appear to be a limiting assumption.

Second, as with any study involving multiple time periods, several assumptions must be made regarding variables which may alter the project's rate of return, such as the expected capital appreciation rate. For purposes of this study, these variables will be conservatively estimated, consistent with prior studies of rental housing. Third, this study implicitly assumes that risk variables specific to real estate investments (e.g., operating risk and tax risk¹⁶) are incorporated in the internal rate of return on the investment. To the extent that this assumption is not met, the investment equation would be misspecified, since in theory, the investment decision should incorporate risk factors. In terms

of additional risk specific to low income housing investments, no empirical evidence to date supports an increased risk assessment for such projects [Brueggeman et al., 1982]. More importantly, for purposes of this study, there is no evidence to support changing risk levels related to low income housing projects over the period of the study.

Finally, it could be argued that returns available on alternative investments other than tax-free municipal bonds should be included in the model as a measure of the opportunity cost of investment in low income housing. However, this study's primary purpose is a descriptive analysis of the effects of tax incentives on low income housing investment. It is assumed that the municipal bond returns variable effectively captures the risk premium effect from alternative investments. The introduction of other investment variables would add little explanatory power to the model, while increasing potential problems from multicollinearity.

Prior Related Research

To date, no research has empirically examined the effects of tax incentives on low income housing investment. Most prior studies in the real estate tax area are based on simulations of either proposed or current tax laws' effects on real estate investment returns.

The body of economic and tax literature examining the behavioral effects of tax laws has generally focused on four

major areas: (1) labor supply effects of income taxes, (2) income tax effects on the compensation form [e.g., Turner, 1987], (3) the compliance behavior of taxpayers [e.g., Clotfelter, 1983], and (4) the effect of income taxes on investment behavior [e.g., Hall and Jorgenson, 1967]. In the latter category, the majority of the literature has been devoted to the reaction of firms to investment tax incentives, such as the investment tax credit [e.g., Hall and Jorgenson, 1967]. Surprisingly, little empirical attention has been devoted to the effects of income taxes on investment behavior in a separate economic market, real estate.

The majority of research in the real estate tax area consists of legal interpretation [e.g., Callison, 1987] and simulation studies [e.g., Stern, 1979; Brueggeman et al., 1982; Dickens, 1983; Fisher et al., 1984; Laverty, 1984; and Goldstein and Edson, 1987]. Studies in the latter category attempt to estimate the impact of various tax law changes on rates of return from real estate investments and related price effects.

Goldstein and Edson (1987) examined the effects of the Tax Reform Act of 1986 on investment returns from a sample low income housing project for a corporate investor, since this Act contained favorable tax provisions for certain corporations investing in rental real estate. Assuming that the corporation is able to fully utilize investment losses produced by the project, the authors estimate the internal

rate of return to be 35 percent, which includes incorporation of certain estimates regarding appreciation and holding period.

Laverty (1984) examined the impact of the Economic Recovery Tax Act of 1981, the Tax Reform Act of 1976 and the Revenue Act of 1978 on investment returns from government-assisted housing syndicated in the limited partnership form. Investor profiles were created by manipulating marginal tax rates, personal service taxable income as a percentage of taxable income, investment holding period, and the selling price of the property. In addition, two levels of tax preference items were considered in the simulation. These investor profiles were applied to Section 8 housing projects obtained from investment prospectuses.

Laverty concluded that pre-1976 prospectuses significantly overstated the tax benefits available to investors. In addition, all of the acts examined were found to negatively impact investment returns on government assisted housing, due to various provisions in the laws, such as a reduction in the marginal tax rate from 70 percent to 50 percent in the Economic Recovery Tax Act of 1981. The provisions specifically enacted to favor low income housing were found to positively impact investment returns.

Fisher et. al (1984) used a simulation procedure to examine the effect of tax law changes occurring in 1976, 1978, 1981 and 1982 on investment returns from nonresidential real

estate. Specifically, the authors determined that tax laws which prior to 1976 favored investment in new nonresidential property over existing properties shifted during the later 1970's and early 1980's in favor of the rehabilitation of existing property.

Contribution to Research

Since low income housing tax incentives were first adopted by Congress, substantial debate has existed between certain factions of the federal government (i.e., the Departments of Treasury and Housing and Urban Development), low income housing advocates and lobbying groups, housing trade groups, and housing economists as to the actual economic benefits provided by such incentives. Establishing the parameters for a "successful" housing tax incentive entails several considerations, including the efficiency and effectiveness of the incentive.¹⁷ From the perspective of Congress, a tax incentive would likely be viewed as successful if it motivates significant positive reaction by taxpayers, which in the case of low income housing means the production of additional housing above that which would have been constructed in the absence of tax incentives.

Empirical analysis of the success of low income housing tax incentives has been virtually nonexistent. Several studies have used simulation models to predict the effect of tax law changes on rates of return from low income housing investments, but none have examined the actual investment

impact. This is the critical issue, since the value of a tax incentive is zero unless it motivates the desired reaction from investors. In design, a tax incentive may be appealing based on its projected rate of return effect. But if other economic and institutional factors act to limit investment, the tax incentive's actual value is reduced or negated.

Given the declining level of direct government subsidy to support low income housing construction, tax incentives occupy a position of greater importance in providing competitive investment returns to low income housing investors. This study attempts to provide a measure of the effectiveness of low income housing tax incentives in stimulating the production of low income housing over the period of availability of such incentives. This measure should be of value to policy makers in designing or revising future tax legislation to support the housing needs of low income individuals.

Chapter Summaries

The remaining chapters are organized as follows: Chapter II discusses the tax treatment of low income housing under Federal income tax laws from 1970 through 1987. Chapter III discusses the development of the research models utilized in the study to examine the three issues under consideration. Chapter IV discusses the research methodology in terms of utilization of the data to examine the research questions. Chapter V presents a discussion of the research results and

answers to the research questions. Chapter VI provides a summary of the research undertaken and its conclusions.

Notes

1. The Internal Revenue Code has defined low income housing in a variety of ways. Under pre-TRA86 law, low income housing was defined as follows:

"section 1250 property with respect to which a mortgage is insured under section 221(d)(3) or 236 of the National Housing Act, or housing financed or assisted by direct loan or tax abatement under similar provisions of State or local laws and with respect to which the owner is subject to the restrictions described in section 1039(b)(1)(B)" [I.R.C. §1250(a)(1)(B)(i)].

"dwelling units which, on the average, were held for occupancy by families or individuals eligible to receive subsidies under section 8 of the United States Housing Act of 1937, as amended, or under the provisions of State or local law authorizing similar levels of subsidy for lower-income families" [I.R.C. §1250(a)(1)(B)(ii)].

"section 1250 property with respect to which a loan is made or insured under title V of the Housing Act of 1949" [I.R.C. §1250(a)(1)(B)(iii)].

For purposes of the special low income housing tax credit, enacted as part of the Tax Reform Act of 1986, low income housing is defined according to income characteristics of the occupying tenant population. Qualifying low income tenants are those tenants having incomes less than or equal to either 50 percent or 60 percent of the area median income, adjusted for family size.

2. A Pigouvian tax subsidy is a tax provision which reduces the cost of the supported activity.
3. An externality results from the difference between benefits provided to society from a certain activity (e.g., housing for the poor) and the benefits provided to private producers of that activity in the form of economic return on investment. Essentially, externalities result from a breakdown of the pricing system in allocating resources to desired activities [see Gravelle, 1980].

4. The "cost" of a tax incentive is the revenue lost through provision of that incentive.
5. The design of a tax incentive implicitly assumes a reaction on the part of informed, rational taxpayers. This assumption may be open to question in actual practice due to such factors as uncertainty on the part of taxpayers related to tax treatment and lack of an "efficient" market in terms of communication of the tax incentive's value to all potential investors.
6. This presumption ignores two effects. First, investors may shift capital between economic sectors, given the availability of tax of incentives. Second, indirect effects from the tax laws may exist, such as a change in the overall interest rate.
7. This has been a controversial point in the public economics literature, given the inability of economists to provide a meaningful measure of social welfare. Some economists advocate redistributive policies which maximize the total welfare of individual members of society, without considering distributional rankings among the members, while others advocate the maximization of utility of the worst-off individual member of society [see Tresch, 1981 (p. 24) and references therein]. The provision of tax subsidies to low income housing producers and tenants would probably fall in between these two extreme positions, since the provision of subsidies is at the expense of potentially lower general tax rates for higher-income members of society, but not to the extent of providing equitable housing for low income recipients in relation to the general population.
8. Section 2, p. 413.
9. Ibid.
10. The Housing Act of 1961 added the Section 221(d)(3) Program, which provided interest subsidies to private lenders related to rental housing developments. The Housing Act of 1968 added the Section 235 Program, which provided a subsidy to individuals in making mortgage payments and the Section 236 Program, which provided interest subsidies to private lenders on loans to developers of rental property. The Section 236 Program superseded the Section 221(d)(3) Program. In response to criticism of the Section 236 Program related to cost and default rates, the Nixon administration imposed a moratorium on all new activities under the major subsidy programs after January 5, 1973. Since that time, no

additional units have been financed under the Section 236 Program.

The Section 8 Program was enacted as part of the Housing and Community Development Act of 1974. It provided several forms of housing subsidy: (1) rent supplements to low income individuals, where economic rent payments (established by the Department of Housing and Urban Development) exceeded 25 percent of income and (2) low interest financing, through the creation of tax exempt financing (issued by local housing authorities) for private developers. The Act allowed local authorities to develop new construction and utilize the lower rate financing. State housing agencies were also empowered to issue tax exempt bonds under the program. Tax incentives could also be used in conjunction with the Section 8 subsidies. The Section 8 New Construction Program was cancelled for the fiscal year 1986 and subsequent years.

In 1983, a housing voucher program was adopted, which provided a subsidy for rent payments to landlords on the behalf of tenants. Under this program, Housing and Urban Development (HUD) pays the difference between 30 percent of the tenant's income and the fair market rent (which is established by HUD) [U.S., Joint Committee on Taxation, 1988].

11. For example, under the Reagan administration, the budget for the Department of Housing and Urban Development has been reduced from a level of almost 8 percent of the total federal budget in 1978 to approximately 1 percent in 1988.
12. Testimony by Eugene Steuerle, Deputy Assistant Secretary for Tax Analysis, U.S. Treasury Department, before the Subcommittee on Select Revenue Measures of the Committee on Ways and Means, House of Representatives.
13. These preferences are greater for low income housing as compared to other forms of investment real estate (e.g., conventional residential real estate and nonresidential real estate).
14. However, this assumes that as a result of the tax law change, low income housing investment is also more attractive on a relative basis, compared to alternative investments. This presumption ignores the effects of other tax changes within the same bill which might also increase the economic attractiveness of alternative investments (e.g., more favorable treatment of non-residential real estate).

15. Internal rates of return were estimated under three different sets of assumptions for the sample housing project. These assumptions are detailed in Chapter III.
16. Tax risk refers to the possibility that certain tax benefits available at the date of a project's inception may be curtailed or eliminated by Congress at a later date, the effect of which would be a reduction in the after-tax rate of return on investment (e.g., enactment of the passive activity loss limitations in 1986).
17. The efficiency of a tax incentive is measured by the welfare effects at a given cost, or the cost of the incentive at a given level of welfare. Effectiveness relates to the response of taxpayers to the incentive.

CHAPTER II
FEDERAL INCOME TAX TREATMENT
OF REAL ESTATE

Introduction

Historically, tax benefits have provided a major source of the returns on real property investments, and in many cases dominated the other forms of investment return (e.g., operating income, capital appreciation). Since the enactment of the Tax Reform Act of 1969 (TRA69), investors in low income housing have received preferential tax benefits when compared to those available for other categories of investment property (e.g., conventional residential rental property¹ or nonresidential real property).

An explanation of the tax treatment of real property investments over the period 1970-1987 is presented below. This study does not consider any state or local tax benefits available to real property investors, since such benefits vary by state and locality and the primary research focus of this study is the reaction of taxpayers to federal tax incentives.²

Depreciation

The Internal Revenue Code provides "there shall be allowed as a depreciation deduction a reasonable allowance for the exhaustion, wear and tear...--(1) of property used in the trade or business, or (2) of property held for the

production of income".³ Generally, the cost of property purchased for investment purposes includes both the cost of building and land. The cost of land is not considered depreciable by the Internal Revenue Service (I.R.S.).⁴

The depreciation deduction allowed on investment property provides a major portion of the after-tax rate of return on such investments. This is primarily due to the ability to depreciate the total basis of depreciable property, which includes any amounts financed through the use of debt together with the equity investment, although the debt must represent a bona fide obligation.⁵ Thus, the taxpayer receives a deduction, and therefore, potential cash flow benefit, not only on amounts actually invested, but also on amounts borrowed, thus providing a valuable tax benefit. This depreciation deduction calculated on depreciable basis, as defined by the Internal Revenue Service, provides the taxpayer a potential tax shelter, since taxes are applied only to taxable income (revenues less all operating expenses and depreciation), and not to cash flow from the activity.

The Tax Reform Act of 1969 provided for a 5-year recovery period (straight-line basis) for the costs incurred to rehabilitate low income rental housing as compared to 40-year (200% declining balance) and 45-year (150% declining balance) recovery periods for comparable investments in conventional residential and nonresidential property, respectively. New low income rental property, together with new investments in

conventional residential rental property, were required to be depreciated over the 45-year period.⁶ The aggregate amount of rehabilitation expenditures qualifying for this accelerated recovery period was limited to \$20,000 per dwelling unit.⁷

According to the I.R.S., rehabilitation expenditures means "amounts chargeable to capital account and incurred for property or additions or improvements to property with a useful life of 5 years or more, in connection with the rehabilitation of an existing building for low-income rental housing".⁸

Under the Economic Recovery Tax Act of 1981, the system of accelerated cost recovery was instituted for all categories of depreciable property, including real property. Investments in new low income housing were recoverable using the 200 percent declining balance method over a 15-year recovery period compared to using the 175 percent declining balance method and a 15-year recovery period for investments in other real property categories.⁹ However, under this act, the taxpayer has the election to adopt a longer recovery period using straight-line depreciation. In the case of real property, the taxpayer could adopt recovery periods of 19, 35 or 45 years.¹⁰

This recovery period for low income housing continued under the Tax Reform Act of 1984. However, the recovery period was lengthened for conventional residential rental property and nonresidential rental property to 18 years. The

175 percent declining balance method continued in use under this act.¹¹

In 1985, the recovery period for real property, other than low income housing, was lengthened to 19 years. The 175 percent declining balance method continued in use under this act.¹²

The Tax Reform Act of 1986 (TRA86) made substantial modifications to cost recovery provisions for all real property investments. A Modified Accelerated Cost Recovery System (MACRS) was introduced in place of the former Accelerated Cost Recovery System (ACRS). Under the new system, both residential rental property and nonresidential rental property must be depreciated using the straight-line method. The recovery periods for residential rental property (including new low income housing) and nonresidential rental property were extended to 27.5 years and 31.5 years, respectively.¹³ The 60-month recovery period for low income housing rehabilitation expenditures was repealed by this Act.

Construction Period Interest and Taxes

Prior to the Tax Reform Act of 1976, expenditures for taxes and interest incurred during construction of real property could be expensed during the period of expenditure. This tax treatment was repealed by the 1976 Act, which required such expenditures to be capitalized and amortized over a period not less than 10 years, subject to a phase-in

schedule, which was to take effect for low income housing in 1982.

The Economic Recovery Tax Act of 1981 repealed this provision in the case of low income housing, and thus restored immediate expensing of construction period interest and taxes.

This expensing provision was repealed by the TRA86. Therefore, subsequent to December 31, 1986, all construction period interest and taxes incurred related to low income rental housing must be capitalized, and depreciated over the life of the depreciable property.

Depreciation Recapture

Historically, real property held for investment purposes or used in a trade or business has qualified for capital gain treatment on disposition. The advantage of capital gain treatment on the disposition of assets is substantial, since preferential tax rates have generally been available on such gains.¹⁴ This tax preference can have a significant effect on the returns available from real property investments. However, depending on the holding period of the property, part or all of the allowable depreciation on the disposed property may be recaptured as ordinary income when the disposition occurs, thus negating the advantage of capital gain treatment.

The Tax Reform Act of 1969 instituted new recapture rules for real property dispositions.¹⁵ For dispositions after 1969, the excess of post-1969 accelerated depreciation over straight-line depreciation on nonresidential real property was

recaptured 100% and taxed as ordinary income. For residential rental property, post-1969 depreciation in excess of the straight-line amount was fully recaptured if the property was held for 100 months or less. For each month the property was held over 100 months, the recapture percentage decreased by 1%. For low income housing, the recapture percentage decreased by 1% for each month the property was held in excess of 20 months.

The depreciation recapture preference available to investors in residential real property was reduced by the Tax Reform Act of 1976. For post-1975 investments in any real property category other than low income housing, all depreciation allowed in excess of the straight-line amount is recaptured as ordinary income in the event of asset disposition. For low income housing, the recapture percentage is decreased by 1% for each month the property is held in excess of 100 months.

Capital Gains and Losses

To encourage investment in real property, Congress has traditionally allowed any long-term gain on the sale of real property to qualify for the capital gain preference, thus reducing the tax on such gain.

Prior to the Tax Reform Act of 1976, taxpayers were allowed a deduction of 50 percent of net long-term capital gains resulting from the sale of capital assets and assets used in a trade or business. In addition, taxpayers could

elect an alternative 25 percent tax rate on long term capital gains per year (up to a maximum of \$50,000 per year).

The Tax Reform Act of 1976 increased the required holding period for long-term capital assets from 6 months to one year.

The Revenue Act of 1978 increased the capital gain deduction to 60 percent of net long-term capital gains, and repealed the alternative 25 percent rate for tax years after 1978.

Under TRA86, eligibility for capital gain treatment under Section 1231 is retained for most real property investments. However, the 1986 act repealed the capital gains deduction for individuals. For 1987, long-term capital gains are taxed at a 28 percent rate, while short-term gains are taxed at ordinary rates. For 1988, the distinction between long-term and short-term capital gains is eliminated, and therefore, all gains are taxed at a 28 percent rate.¹⁶

Prior to the Tax Reform Act of 1976, only \$1,000 of net capital loss (per year) could be used to offset ordinary income. In addition, \$2 of loss was required to offset each \$1 of ordinary income. The Tax Reform Act of 1976 increased this loss offset amount to \$2,000 for 1977, and \$3,000 for 1978 and thereafter. Under the TRA86, the \$3,000 loss limitation is retained, but the 2 for 1 loss offset for long-term losses is repealed.¹⁷

Operating Income and Losses

Income derived from investments in real property is generally gross income under the Section 61 definition.¹⁸ Likewise, expenses incurred related to real property investments are generally deductible under Sections 162 or 212. The major problem in the case of expenditures related to real property is determining whether such amounts can be deducted in the period incurred or instead capitalized and amortized or depreciated over future periods. Generally, if the expenditure extends the useful life of the property, it must be capitalized rather than expensed.

In the case of most real property investments, the largest tax deduction is depreciation expense. The ability to deduct depreciation expense on leveraged property produces a tax shelter, whereby the property provides a positive net cash flow to the investor, but produces an operating loss for tax purposes which, under the income tax laws prior to TRA86, could be used to shelter unrelated income of the taxpayer, such as salaries, dividends or interest.

Due to the abuses of this tax provision, which led to the creation of many tax-shelter motivated investments, Congress substantially modified the related tax provisions under the TRA86. Under this act, all investment income and losses are grouped into one of three categories: (1) passive, (2) active, or (3) portfolio. In general, all rental activities are considered passive activities.¹⁹ Thus, losses

from rental activities can only offset passive income. This effectively eliminates the tax shelter benefit available under the prior law, since the ability to offset operating losses on real property investments with unrelated income is no longer available. However, unused passive losses can be carried forward to future years and applied against passive income.²⁰

If a taxpayer disposes of his entire interest in a passive activity during the tax period, any loss from such activity which has not been previously allowed as a deduction may be utilized to offset other income, in the following order: (1) income or gain from the passive activity for the taxable year, (2) net income or gain for the taxable year from all passive activities, (3) any other income or gain.²¹

For non-dealers in real estate, the only exception to the passive loss rule is that up to \$25,000 of real estate losses and credit equivalents can be used to shelter unrelated income, if the investor is an active participant in the activity. An individual qualifies as an active participant in an activity if, at any time during the period of time the activity is conducted, his interest is greater than 10 percent (by value) of all interests in such activity. However, for investors in low income housing, this participation requirement is waived.²² This \$25,000 amount is reduced by one-half of the taxpayer's adjusted gross income in excess of \$100,000 (for married couples filing jointly).²³ A special

rule applies to low income housing. The \$25,000 amount is reduced by one-half of the taxpayer's adjusted gross income in excess of \$200,000.²⁴ For purposes of this provision, adjusted gross income is computed without regard to (1) any amount includible in gross income under §86 (i.e., social security benefits), (2) any amount allowable as a deduction under §219 (i.e., individual retirement accounts), and any passive activity loss.²⁵

At-Risk Rules

Since 1977, the tax laws have restricted the deduction of investment losses to amounts considered "at-risk" in the investment (e.g., cash, property, and amounts financed with recourse debt). However, real estate investments have generally been exempt from the at-risk rules, thus providing investors in real property a tax benefit through allowance of deduction of amounts not actually invested in the property. TRA86 repealed this exemption for real estate.²⁶ However, an exception is provided for property financed with "qualified nonrecourse financing", which certain real property may qualify for.²⁷

Deduction of Investment Interest

Prior to the TRA86, the deduction for interest expense incurred on property held for investment was limited to \$10,000 (married couples filing jointly) plus net investment income.²⁸ However, interest expense incurred related to rental housing was exempt from this provision.²⁹

TRA86 treats interest expense incurred on passive investments as includible in the definition of passive income or passive loss, which effectively limits its deductibility within the guidelines of the passive loss rules.³⁰

Ordinary Tax Rates

Income tax rates play a major role in the taxation of real property investments. Under laws existing prior to the TRA86, the common motivation for investment in real property was the generation of operating losses. In such cases the greater were the income tax rates, the greater was the tax benefit from the operating loss deduction. When tax rates increase, the government effectively bears a higher percentage of the risk of investment, and conversely, the risk burden shifts to the taxpayer when the tax rates decrease.

Prior to the Economic Recovery Tax Act of 1981 (ERTA 81), the maximum marginal tax rate for individuals was 70 percent, although a 50 percent tax rate was applicable for personal service income (e.g., salaries). ERTA 81 reduced the maximum tax rate to 50 percent on all income, other than capital gains.

The TRA86 reduced the maximum rate further to 28 percent, although a 33 percent rate is applicable for certain high income taxpayers.³¹ From an investor's perspective, this reduced the value of tax deductions, since a smaller portion of the deduction affects the tax paid by the investor.

For example, over the period 1970 to 1987, the maximum marginal tax rate decreased from 70 percent to 28 percent. Given a real property investment which produces an operating loss of \$100, the value of this deduction was decreased by \$42 over the period. Of course, this does not consider the potential tax savings from other income, or the restrictions imposed on passive loss deductions under TRA86.

Low Income Tax Credit

During the tax reform proceedings of 1985 and 1986, Congress expressed its belief that existing tax incentives available to investors in low income housing were inefficient and ineffective, since tax subsidies were being provided to investors in low income housing with minimal requirements to actually provide housing to true low income individuals. This led to the restructuring of the federal tax incentives available to investors in low income housing through the TRA86.³²

The TRA86 replaced the majority of incentives for investors in low income housing with a single tax credit,³³ with the objective of better targeting the tax benefits to true low income individuals.

For buildings placed in service during 1987, a credit of 9 percent of the qualified basis is available for new buildings and for substantially rehabilitated buildings which are not federally subsidized, or 4 percent of the qualified basis for new buildings which are federally subsidized and for

existing buildings not substantially rehabilitated. For buildings placed in service after 1987, the credit percentages are those which will yield over a 10-year period credit amounts which have a present value of 70 percent of the qualified basis of new, non-federally subsidized buildings, and 30 percent of the qualified basis of federally subsidized or existing buildings.

Qualified basis, for purposes of determining the available credit, is based on the number of low income units in the building or floor space occupied by low income units, as a percentage of total units or total floor space, respectively, whichever percentage is smaller.

Additions to qualified basis are also eligible for the tax credit, using a credit percentage equal to two-thirds of the applicable credit percentage allowable for the initial qualified basis.

To qualify as a low income building, one of the following set aside requirements must be met: (1) 20 percent or more of the residential units in the project are both rent-restricted and occupied by individuals whose income is 50 percent or less of area median gross income, (2) 40 percent or more of the residential units in the project are both rent-restricted and occupied by individuals whose income is 60 percent or less of area median gross income. The taxpayer (investor) must elect either of the two requirements. This election, once made, is irrevocable. A residential unit is considered rent-restricted

if the gross rent with respect to such unit does not exceed 30 percent of the income limitation elected, adjusted for family size.

To receive the low income housing credit, authority must be received from the local or state housing office which maintains jurisdiction over housing projects in the area where the project is located. The total amount of credit which may be granted by any state per calendar year is limited to an amount equal to \$1.25 multiplied by the state population.

In addition to the tax credit, investors in low income housing receive additional tax benefits. In general, low income housing is considered a rental real estate activity, and thus the available credit is limited to the tax liability generated from passive activities. However, low income housing investors are allowed to use up to \$7,000 of credit or \$25,000 of loss to shelter tax from non-passive activities. This \$7,000 amount is phased out for adjusted gross incomes in excess of \$200,000³⁴ (50 cents of phaseout for each dollar of income). In addition, the investor in a low income project is not required to actively participate to receive the credit.

Qualified low income projects must meet the set aside requirements for a period of 15 years.³⁵ If such requirements are not met, all or a portion of the credit is recaptured, resulting in additional tax liability to the taxpayer.

Tax Preferences³⁶

Taxpayers who utilize certain tax preferences (e.g., accelerated depreciation) have historically been subject to the potential of an additional tax liability resulting from excessive use of such preferences. These tax provisions are a result of Congressional intent to promote increased fairness of the tax system by requiring payment of some minimum tax liability by all taxpayers.

The 1969 Tax Reform Act instituted a minimum tax for individuals, trusts, estates and corporations. Under this provision, these taxpayers are liable for an additional tax on certain tax preferences. In the case of an investment in real estate, related tax preferences would include the deductible portion of net capital gains and the excess of accelerated depreciation over straight-line depreciation on the property. Under the 1969 Act, the minimum tax is computed as 10 percent of the tax preferences less an exemption of \$30,000 for married filing jointly and the regular income taxes imposed for the year. This provision was effective for tax years after 1969.

The 1976 Tax Reform Act increased the percentage for calculating the minimum tax from 10 percent to 15 percent of tax preferences less the greater of \$10,000 (for married taxpayers filing joint returns) or one-half the regular income tax liability (less certain tax credits). The 1976 Act also

increased the eligible tax preferences to include excess itemized deductions.

The 1978 Revenue Act instituted an alternative minimum tax effective for tax years after 1978. The alternative minimum tax was calculated as the sum of taxable income plus capital gains plus the adjusted itemized deductions preference, less an exemption amount of \$20,000. This amount, alternative minimum taxable income, was taxed at a rate of 10 percent on the first \$40,000, 20 percent on the next \$40,000, and 25% on such income above \$80,000. The tax liability equaled the higher of the alternative minimum tax or the regular income tax liability (including any regular minimum tax). In addition, this Act eliminated the excess itemized deductions preference and the capital gains preference from the list of tax preferences subject to the minimum tax.

Section 201(d)(1) of the 1982 TEFRA repealed the minimum tax for tax years after December 31, 1982. In addition, the alternative minimum tax preferences were expanded to include the dividend and interest exclusion, among others. Also, the exemption amount and the itemized deductions not included in the excess deductions category were revised.

The 1986 TRA repealed the dividend exclusion and the net capital gain deduction, and thus these items no longer qualify as tax preferences. Accelerated depreciation on property placed in service after 1986 is a tax preference.

Tax Exempt Financing

Under pre-TRA86 law, residential rental projects qualified for tax-exempt financing if 20 percent of the units were occupied by low and moderate income individuals. A tenant met the income test if the aggregate income of all persons living in the unit did not exceed 80 percent of the median gross income for the area. This percentage was adjusted based on family size. Under the TRA86, the income test is tightened, such that at least 20 percent of the units in the project must be occupied by persons with 50 percent or less of the area's median gross income. The issuer may elect at the time of issuance for a different income test, that being 40 percent of the units are rented to persons with 60 percent of the area's median gross income.

In addition, if tenant incomes increase to a level which exceeds 140 percent of the income limit, they no longer are treated as qualifying tenants. Under pre-TRA86 law, tenants which initially qualified under the original income limits continued to be qualified tenants, regardless of any subsequent increase in incomes.

Notes

1. According to the Internal Revenue Service, a building is defined to be residential rental property if "for any taxable year 80 percent or more of the gross rental income from such building or structure for such year is rental income from dwelling units" (Internal Revenue Code (I.R.C.), §167(j)(2)(B)). All references are to the Internal Revenue Code of 1986 unless otherwise indicated.
2. Tax benefits at the state and local level may include property tax relief, investment tax credits, and favorable depreciation provisions.
3. I.R.C., §167(a).
4. The costs necessary to prepare the land for construction (e.g., site clearing, grading) may be depreciable. The I.R.S. has allowed costs of excavating, grading and removal costs directly associated with the construction of buildings to be depreciated, as opposed to increasing the cost basis of the land itself, which can never be depreciated [Treas. Reg. §1.167(a)-2].
5. In the case of a limited partner in a limited partnership, to receive this depreciation benefit, the financing must be structured such that none of the partners have any personal liability as to the partnership liability. Where none of the partners have any personal liability with respect to a partnership liability, then all partners are considered to share such liability according to their profit-sharing percentages [Treas. Reg. §1.752-1(e)].
6. For assets placed in service after July 24, 1969. Many taxpayers used a 33-year life for new residential construction, under a "facts and circumstances" approach to determining the useful lives of assets. This useful life was upheld in several court rulings [see Brueggeman et al., 1982, p. 225].
7. I.R.C., §167(k)(2).
8. I.R.C., §167(k)(3).
9. I.R.C., §168. This applies to assets placed in service after 1980. Certain transitional rules exist which will not be considered in this study.
10. I.R.C., § 168(b)(3).

11. For assets placed in service after June 22, 1984.
12. For assets placed in service after May 8, 1985.
13. I.R.C., §§168(b)(3) and (c). Alternatively, the taxpayer can elect to use the Alternative Depreciation System under MACRS, in which case residential rental property is depreciated under the straight-line method using a 40-year recovery period.
14. The Tax Reform Act of 1986 eliminated the favorable tax treatment of these gains.
15. The depreciation rules in effect prior to 1970 are not applicable to the time period of this study.
16. Beginning with the 1988 tax year, a 33 percent tax rate may apply which effectively recaptures the tax benefits available for personal and dependency exemptions [I.R.C., §1(g)].
17. I.R.C., §1211(b).
18. I.R.C., §61(a).
19. I.R.C., §469(c)(2).
20. I.R.C., §469(b).
21. I.R.C., §469(g)(1)(A).
22. I.R.C., §469(i)(6)(A) and (B).
23. I.R.C., §469(i)(3)(A).
24. I.R.C., §469(i)(3)(B).
25. I.R.C., §469(i)(3)(D).
26. I.R.C., §465.
27. Qualified nonrecourse financing is any financing which (1) is borrowed by the taxpayer with respect to the activity of holding real property, (2) is based on a commercially reasonable loan contract, and (3) is not convertible debt [I.R.C., §465(b)(6)].
28. I.R.C. of 1954, §163(d).
29. I.R.C. of 1954, §163(d)(1)(B).
30. I.R.C., §163(d)(4)(D).

31. These rates are effective for the 1988 tax year [I.R.C., §1(g)].
32. Tax incentives may also be available to investors at the state level. Such incentives are not examined in this study since they vary from state to state.
33. I.R.C., §42.
34. This is compared to \$100,000 for investors in other rental real estate.
35. I.R.C., §42(g).
36. I.R.C., §§55-58.

CHAPTER III DEVELOPMENT OF THE RESEARCH MODELS

Introduction

This chapter provides a detailed explanation of the economic models utilized in the study to examine the research issues. Two different models are utilized in the study, an internal rate of return model to estimate investment returns over the test period, and a regression equation to test the significance of the investment returns in relation to low income housing production.

Internal Rate of Return

To analyze the effects of tax incentives on low income housing investment, it is first necessary to estimate the effects of tax law changes on the rates of return from investment in low income housing projects. From the perspective of investors in real property, the value of a tax incentive is its effect on the investors' expected after-tax rate of return, *ceteris paribus*.

The rate of return on an investment can be measured in different ways. For example, Brueggeman et al. [1982] and Fisher et al. [1984] use the ratio of a property's annual rent, in equilibrium, to its market value, as a return measure. In their framework, the emphasis is on the

determination of the long-run rental income and price response to tax changes.

Lewis [1987] proposes the use of an annualized rate of return in cases where the occurrence of "nontypical" cash flows may be forecasted with greater certainty, and thus would dictate a different discount rate than that used for riskier future cash flows. Other return measures include the payback period and net present value.

The most widely used return measure in prior studies is probably the internal rate of return (IRR) (see, for example, Stern, 1979; and Dickens, 1983). Conceptually, the IRR is the discount rate which equates the equity investment with the net cash flows occurring over the life of the investment. The IRR as a measure of return on investment has some potential disadvantages as compared to other return measures¹. However, probably more important, the measure of internal rate of return also possesses the advantages of comparability and widespread use in the investment community. This lends support to the IRR as the best available surrogate for investment "attractiveness", which would be utilized by the majority of investors in their investment decisions.

The IRR model utilized in this study is a variant of that used in Brueggeman et al. [1982] and Fisher et al. [1984]. In this model, the total equity investment is set equal to the present value of future cash flows generated by the low income housing project, which consist of operating cash flows (e.g.,

rental income, operating expenses), tax benefits (e.g., depreciation and interest deductions), and net proceeds realized on the disposition of the investment. The internal rate of return (K) is the rate which equates these two sets of cash flows. The internal rate of return model developed for use in this study is described as follows:

$$\begin{aligned}
 (\text{TPC} - \text{CPT} - \text{PF}) &= \sum_{i=1}^s \frac{(R_i - O_i - \text{IEP}_i - P_i) [+/-] \text{TE}}{(1+K)^i} \\
 &+ \frac{V_s - S_s - B_s - G_s t_{si} - \text{DR}_s t_{oi} - \text{LCR}_s}{(1+K)^s}
 \end{aligned}$$

where,

- TPC = total cost of project, including land
 CPT = tax benefit from deduction of construction period interest and property taxes
 PF = project financing
 s = holding period (years)
 R_i = rental income in period i
 O_i = operating expenses in period i
 IEP_i = interest expense (project) in period i
 P_i = principal portion (amortization) of the loan payment in period i
 TE = tax effect = $f(R_i, O_i, \text{IEP}_i, \text{PIT}_i, \text{LIC}_i, D_i, \text{AGI}_i, t_0)$
 PIT_i = passive income of taxpayer (total) in period i
 LIC_i = low income housing investment credit
 D_i = tax depreciation allowed in period i
 AGI_i = adjusted gross income of taxpayer in period i

t_{oi}	=	marginal ordinary income tax rate of taxpayer in period i
V_s	=	estimated value and selling price of project in year s
S_s	=	selling and other transactions costs in year s
B_s	=	balance of mortgage in year s
G_s	=	capital gain, net of selling costs (S_s), resulting from sale in year s
t_{gs}	=	marginal capital gains tax rate of taxpayer in year s
DR_s	=	net excess depreciation which is recaptured upon sale in year s
LCR_s	=	low income housing investment credit recaptured upon sale in year s
K	=	after-tax internal rate of return on equity investment in property held for s years

Internal Rate of Return Analysis

To isolate the effect of tax incentives on investment return, this study employs a two-step procedure. First, the after-tax internal rate of return (ATIRR) (represented in the model by K) is calculated by inclusion of all economic and tax variables in the rate of return model. This ATIRR is then dichotomized into a tax-specific return component (TXRT) and a non-tax return component (NTX), by calculating the before-tax internal rate of return. TXRT is then calculated as $[ATIRR - NTX]$.

Test Period

This study uses a test period of 1970-1985, during which time 6 different tax laws affecting real property investments

were enacted. However, not all of the tax law changes occurring during this period directly affected low income housing.²

Taxpayer and Investment Characteristics: Standard Case Assumptions

The derivation of internal rates of return on real property investments using discounted cash flow analysis involves several key assumptions, such as the tax characteristics of the assumed investor, holding period of the investment property, property appreciation rate, and the degree of leverage financing. Clearly, assumptions are necessary when examining the effects of tax changes in the real estate market, due to the inherent heterogeneity of housing projects and the investor group. However, the choice of values for these variables is of critical importance in such an analysis, since variations can produce non-trivial effects on the calculated internal rate of return.

In the majority of the real estate literature examining tax change effects on the rate of return on investment, the most common treatment is probably the assumption of a maximum tax rate individual investing in real estate through a limited partnership, utilizing a high level of leverage financing (i.e., 75-90 percent), and a relatively short holding period. Although applicable to a large investor group, particularly under pre-TRA86 law, such assumptions do limit research conclusions to the specified investor group, which many

authors fail to acknowledge [Gravelle, 1987; Burman et al., 1987].

For example, Brueggeman et al. [1982] forecasted increases in residential rental property values of 25 percent to 55 percent, based strictly on the tax provisions contained in the Economic Recovery Tax Act of 1981. Such predictions assume that the rental real estate market acts as a perfectly rational, homogeneous investor group, reacting to tax changes in an efficient manner. In reality, the rental real estate market consists of a rather heterogeneous investor group, composed of individuals, limited partnerships (containing both individual and corporate partners), corporations, and tax exempt institutions, which suggests potentially different reactions to tax changes.

In addition, the efficiency of the real estate market (in terms of its reaction to changes in estimated rate of return) is open to question, given the nature of most real property investments (i.e., long-lived, relatively higher risk, and distinct heterogeneity). Further, market efficiency requires proper dissemination of the price change effects among investors. In the case of changes in tax incentives and their related effect on asset prices, this assumption may be open to question [Barlow et al., 1966].

Also, the standard case assumption in many rate of return studies that the typical rental property investor is an individual taxpayer investing through a limited partnership

may be subject to question. Actual U.S. Census Bureau data on privately owned residential rental projects show the limited partnership as accounting for only 56 percent of the investment in large, (conventional) multi-family projects [Gravelle, 1987].³ However, this percentage does indicate that most investors in such projects are limited partners, and thus would not preclude the use of this assumption in a research study. In addition, non-limited partnership investors may be comprised of similar type taxpayers, (e.g., high tax rate individuals).

This study attempts to alleviate these validity concerns in three ways. First, the focus of this study is restricted to low income housing investment which, as detailed previously, possesses unique investment and tax characteristics, compared to other forms of rental property. The nature of low income housing investments would suggest the underlying investor group to be predominantly the higher "tax cost" investors (i.e., those investors with the higher marginal tax rates). Tax changes affect all investors, but the higher tax cost investors are affected more severely. This explains in part the attractiveness of higher-risk, tax-shelter investments to higher tax rate investors. The federal government, by allowing tax deductions, bears a greater proportion of the investment risk for taxpayers in higher marginal tax brackets.

In theory, the highest tax cost investor is the corporation. Although this would appear to suggest the popularity of tax-shelter type investments among corporate investors, actual data indicate that corporations account for only 9.3 percent of the multifamily housing stock [Gravelle, 1987].⁴ Although data is not available relating to the extent of corporate or limited partnership investment in low income housing, the capital requirements and risk of such projects, as with most real property investments, would suggest the involvement of numerous investors, which would require either a syndicated limited partnership or a corporation.

Given the apparent limited extent of direct corporate investment in conventional multi-family housing, the presumption in this study is that limited partnerships represent the dominant investor group in low income housing projects.⁵ In particular, the underlying investor is assumed to be an individual paying taxes at the maximum marginal tax rate, which appears reasonable in the case of most limited partnerships.

An alternative treatment would be the use of a weighted-average tax rate, determined from the composition of all investor groups in the rental real estate market. However, the use of an average tax rate would weaken the validity of the study, since results would be applicable to a smaller subset of taxpayers, since the majority of individual

investors in low income housing projects are apparently at the highest marginal tax rate.

Second, rather than assuming a particular holding period for use in calculating the internal rates of return, this study uses a Lotus 1-2-3 computer model to determine the optimal holding period (i.e., that holding period which maximizes the internal rate of return) among several alternatives, which would be the expected decision strategy of any rational investor [Burman et al., 1987].

The optimal holding period would not necessarily be the same under different tax regimes, due to the interaction of tax laws and investment variables. Investors are assumed to dispose of investment property at the point when the after-tax rate of return is maximized. The optimal holding period is, of course, a function of tax parameters, among others, since tax rules impose penalties on frequent property turnover, through recapture of tax benefits such as accelerated depreciation and tax credits.

Third, the degree of leverage financing is estimated in this study to be eighty percent, which is a typical debt level for rental real estate projects (Price Waterhouse, 1985).⁶ In general, real estate limited partnerships are heavily leveraged, in order to optimally utilize the available tax deduction for investment interest, in addition to the tax advantage of depreciation deductions on the entire property's depreciable basis.

Computer Model

This study utilizes a computer model, developed using Lotus 1-2-3, to calculate internal rates of return under the different investment assumptions and tax regimes in place during the test period. The model is designed to determine the after-tax internal rate of return, the tax component of the internal rate of return, and the nominal component of the internal rate of return, based upon the year and quarter entered by the user, in addition to the particular assumption for the inflation rate (applicable to rental income and operating expenses), and the percentage of leverage financing.

Sources of Data

To estimate the rates of return and the incentive effective of tax changes on low income housing investment, the following data is utilized: (1) measures of quarterly multi-family low income housing starts (STRT), (2) project investment data (e.g., rental income, operating expenses, appreciation rate), (3) taxpayer variables (e.g., marginal tax rate), (4) tax law variables (e.g., depreciation provisions), (5) level of direct government subsidy for multifamily, low income housing, and (6) indexed returns on Aaa, tax-free municipal bonds. Sources for this data are described in Table 3-1.

Table 3-1
Sources of Data

<u>Data Category</u>	<u>Source</u>
Subs. MF housing starts	(1)
Project variables:	
Development costs	(2)
Operating income/expenses	(2)
Capital appreciation rate	(2)
Holding period	(3)
Mortgage interest rate	(4)
Inflation rate	(2)
Debt characteristics	(2)
Taxpayer characteristics	(5)
Tax law variables	(6)
Direct government subsidy	(1)
Municipal bond returns	(7)

- (1) Department of Housing and Urban Development, by quarter.
- (2) Project variables were developed based on a sample low income project (Goldstein & Edson (1987), construction cost indices over the test period, and prior studies which examined rental housing investment returns. The assumptions utilized for this project were varied to assess any differential effects. See Table 3-2 for a complete explanation of the estimation procedure used for each variable.
- (3) A Lotus 1-2-3 model will be utilized to determine the optimal holding period, i.e., that period which maximizes the investor's after-tax internal rate of return.
- (4) Federal Reserve Bulletin.
- (5) Taxpayer characteristics (e.g., tax rate) are developed under the assumption that the marginal investor is an

individual in the maximum marginal tax bracket, with sufficient unrelated income to utilize all losses generated by the low income housing investment.

(6) Internal Revenue Code of 1954 and Internal Revenue Code of 1986.

(7) Moody's Municipal and Government Manual

Empirical Analysis

The second part of this study examines the relationship between tax incentives and low income housing investment behavior. No theoretical or empirical evidence exists relating to the functional form of low income housing investment decisions, other than basic economic theory, which postulates that additional investment will result from an increased rate of return in a given activity, *ceteris paribus*. This study utilizes a rate of return measure as the primary factor in the low income housing investment decision, the form of which is described below.

Regression Models

The level of investment in low income housing, represented by the number of starts⁷ of privately initiated, subsidized multifamily housing for a particular period is posited to be a function of (1) expected tax benefits (TXRT) (2) expected nominal returns on investment, exclusive of tax benefits (NTX), (3) the expected level of direct government subsidy for the investment period (DSUB), and (4) expected returns available on alternative investments (ALRT).

The basic regression model utilized in this study to examine this relationship is described as follows:

$$\text{STRT}_t = \beta_0 + \beta_1(\text{TXRT}_{t-2}) + \beta_2(\text{NTX}_{t-2}) + \beta_3(\text{DSUB}_t) + \beta_4(\text{DSUB}_t)(\text{TXRT}_{t-2}) + \beta_5(\text{ALRT}_{t-2}) + \epsilon$$

where,

STRT_t = number of multifamily subsidized housing starts during period t .

TXRT_{t-2} = tax effect component of internal rate of return on investment in low income housing for period $t-2$.

NTX_{t-2} = non-tax component of internal rate of return on investment in low income housing for period $t-2$.

DSUB_t = level of direct subsidy provided to multifamily subsidized housing for year t .

ALRT_{t-2} = average return available on tax-free, long-term Aaa municipal bonds for period $t-2$.

ϵ = error term with zero expected value and zero correlation with the explanatory variables.

β_0 = intercept term

β_i = parameter estimates ($i = 1$ to 5)

Dependent Variable

The level of investment in subsidized multifamily housing is represented by the number of housing starts (measured by units started) for each quarter (or year) of the test period. Specifically, the number of housing starts initiated under the Department of Housing and Urban Development programs Section 221(d)(3), Section 236, and Section 8 over the test period will be included in the STRT variable, since these were the

primary low income housing programs eligible for preferential low income housing tax incentives.

The Section 221(d)(3) Program was enacted in 1961 to provide rental housing for individuals whose income was too high to qualify for public housing, but not high enough to pay for suitable private rental housing. This program provided an interest subsidy to private developers of rental housing.

The Section 236 Program was enacted in 1968 to replace the 221(d)(3) Program. Basically, the 236 Program was similar to the 221(d)(3) Program, in that an interest subsidy was provided to private developers on loans to construct new low income housing units or rehabilitate existing units.

The Section 8 Program was instituted in 1974. Under the new construction part of this program, the government subsidized the rents of low income tenants for a specified period. Developers of Section 8 housing were also eligible to receive below market financing.

Independent Variables

For purposes of this study, the internal rate of return is dichotomized into two components: (1) a tax specific component (TXRT) and (2) a non-tax component (NTX). The tax specific component of the IRR is derived from the effects of the tax laws on the investment return, while the non-tax component is derived from operating cash flows, inflation, nominal interest rates and the net proceeds realized on the

disposition of the investment (excluding tax effects). This dichotomization is necessary in order to model the behavioral effects of tax incentives on low income housing construction separate from the operational effects. Without this treatment, investment behavior could not be attributed to tax effects individually, since other economic variables (e.g., rental income, operating expenses, inflation) also impact on the internal rate of return.⁸

Direct government subsidies to developers of low income housing include expenditures for grants, loan guarantees and below market financing. Substantial debate exists concerning the value of low income housing tax incentives in the absence of direct subsidies. For example, tax subsidies may provide investment incentives at the margin, given that a direct subsidy is also available, directly or indirectly, to the developer. This effect is examined through the use of a subsidy variable (DSUB) in the investment model, both individually and through an interaction term with the tax return variable.

The sum of federal expenditures for the 221(d)(3) Program, the Section 236 Program, and the Section 8 Program, for each year of the test period, is utilized as a measure of the direct subsidy available to investors in the three housing programs examined in this study.⁹ An alternative treatment would be to include the subsidy effect as a rate of return value, similar to the TXRT and NTX, since most projects were

eligible for some form of direct subsidy. However, due to data limitations, the rate of return effect from direct federal subsidies is not available.

In addition to direct returns (i.e., tax benefits, non-tax returns, and direct subsidy), the low income housing investment decision is hypothesized to be a function of returns available in alternative markets (i.e., an opportunity cost effect). Among investment alternatives, low income housing is in some respects a substitute good (ignoring risk) for other investments (both real property and non-real property), given a limited amount of available investment capital. Thus, a change in investment returns in other markets relative to low income housing investment returns produces a shift in the supply curve for low income housing, *ceteris paribus*, due to the relative change in attractiveness of low income housing compared to alternative investments.

This effect is represented in the model by an indexed return on long-term, tax-free, Aaa¹⁰ municipal bonds (ALRT). Municipal bonds are utilized as the alternative investment based upon their tax characteristics, differing risk characteristics in relation to real estate, and low serial correlation with real estate returns [Ibbotson and Siegel, 1984]. This dichotomy is clearly not intended to represent all available investment alternatives, but only a relatively low-risk alternative to real estate investment.

Tax and Investment Variables

The internal rates of return utilized in this study to examine the impact of taxes on investment in low income housing are estimated based on a standard case investment project¹¹ developed for each quarter of the test period, together with assumptions for the tax characteristics of the underlying investor.

Project variables (e.g., cost, appreciation rate) are developed through use of cost indices and analysis of prior studies which examined the effects of tax changes on residential rental housing. Certain investment data for prior years of the test period was estimated due to the unavailability of actual data for those years. The basis for these estimates are presented in Table 3-2, together with related assumptions used in the study.

Table 3-2
Housing Project Assumptions

		<u>Reference</u>
Project size (in units)	200	
Development cost per unit	\$38,000	(1)
Cost allocated to land	11.3 %	(2)
Cost allocated to depreciable property	71.2 %	(2)
Construction period interest	8.0 %	(2)
Construction period taxes	1.0 %	(2)
Other fees (e.g., closing costs)	1.5 %	(2)
Syndication/legal costs	7.0 %	(2)
Financing percentage	80.0 %	(3)
Term of loan	25 years	(4)
Rental income	.117(Project cost)	(5)
Operating expenses	.480(Rent)	(6)
Inflation factors: rent	.030/.00	(7)
Inflation factors: oper. expense	.040/.00	(8)
Appreciation rate: property value	.040	(9)
Depreciation rate: property value	.015	(10)
Selling expenses/selling price	.055	(11)

Explanation of references

- (1) Goldstein & Edson [1987]. This amount represents an estimated cost figure for 1986. Development cost amounts were estimated for each year of the test period using the Boeckh Index of apartment construction costs for the test period of 1970-1985.

- (2) These percentages are based on a 1972 study by Touche Ross and Co. of tax considerations in real estate investment. No evidence exists to indicate the percentages have varied significantly during the latter 1970's or first half of the 1980's [Brueggeman et al., 1982]. For comparison purposes, the following additional assumptions were considered in the analysis:

Cost allocated to land	20.0% (low)	6.0% (high)
Cost allocated to depreciable property	66.5% (low)	78.5% (high)
Construction period interest	6.0% (low)	8.0% (high)

- (3) This represents a typical financing percentage for rental real estate projects [Price Waterhouse, 1985], since certain tax provisions are more advantageous to highly leveraged projects. Leverage percentages of 70 percent (low) and 90 percent (high) were also considered.
- (4) Goldstein & Edson [1987].
- (5) De Leeuw & Ozanne [1979]. For comparison purposes, rental income/project cost percentages of 15 percent (low) and 7 percent (high) were also considered.
- (6) Brueggeman et al. [1982] established an operating cost/rental income ratio of 46 percent based on a survey of conventional rental apartment units. Low income properties would be expected to have a higher operating cost ratio due to the nature of the tenant group, although estimates of this percentage are not available.

To be conservative, this study uses an operating cost ratio of 48 percent. To the extent this percentage is overstated, calculated internal rates of return will be understated.

- (7) Rental income on federally subsidized low income housing projects is generally restricted. In prior studies of the impact of taxes on low income housing, rent increases vary from a zero rate [LIHC, 1987] to a four percent rate [Goldstein & Edson, 1987]. Clearly, rent levels on low income projects would not be expected to follow the typical price indices, due to the rent restrictions in effect. This study uses an inflation factor of 3 percent per year [Neubig & Wilson, 1987]. To the extent that this percentage is understated, calculated internal rates of return will be understated. For comparison purposes, a zero percent inflation rate is also considered.
- (8) The inflation factor assumed for operating expenses varies in different rental housing studies. Operating expenses would be expected to increase over time due to normal inflationary trends. However, the prediction of a specific percentage increase over a long time period is difficult to support. Without specific data, the question is to what degree did investors in each year of the test period consider inflation in estimating operating expenses. Possible alternatives would include the use of the price index for the particular year in

question, an average index over a number of prior years, or simply the assumption of zero inflation. For purposes of this study, the operating expense inflation estimate will be computed using an average of four percent, which, on an average basis, is assumed representative for the test period. For comparison purposes, a zero percent inflation rate is also considered.

- (9) Estimates are not available related to the appreciation rate on low income housing projects. Such projects would be expected to show a differing appreciation rate when compared to conventional apartments due to the less desirable location of most low income housing projects. This study assumes a gross capital appreciation rate of 4 percent per year. To the extent that this percentage is understated, calculated internal rates of return are understated. For comparison purposes, appreciation rates of four percent (low) and 2.5 percent (high) were also considered.
- (10) The rate of capital depreciation on conventional residential properties has generally been estimated to be in the range of .5 percent -.8 percent per year (NAHB [1986]). In their 1985 study of conventional apartment investments, Price Waterhouse used a capital depreciation rate of 1.5 percent. Low income housing properties would be assumed to have a higher rate of economic depreciation, due to the nature of the tenant group.

This study utilizes a rate of capital depreciation of 1.5 percent. To the extent that this rate is understated, calculated internal rates of return will be overstated.

(11) Brueggeman et al. [1982].

Notes

1. Several authors [e.g. Brealey and Myers, 1984; Brigham, 1986] have questioned the use of the IRR model in evaluating long-lived investments. The most common criticism of the IRR model is the assumed reinvestment of project cash flows at the calculated IRR. The recommended alternative to IRR, according to these authors, is net present value (NPV), which is calculated based on specification of the cost of capital for each future investment period. However, this procedure involves subjective prediction of investors' discount rates to obtain a realistic NPV.
2. Tax changes affecting other real property investments, such as nonresidential real estate, could implicitly affect the value of low income housing, since all projects are essentially evaluated by investors on a relative basis.
3. This represents investment in all multifamily projects, including conventional and low income projects. Separate data is not available on limited partnership involvement in low income housing construction.
4. This estimate considers only direct corporate investment. Clearly, corporations could invest in rental projects either as a general partner or limited partner in a limited partnership, although data is not available relating to the extent of such investment. Under TRA86, given the less restrictive treatment of passive losses to corporations compared to individual investors, direct rental real estate holdings by corporations may increase.
5. As a result of the Tax Reform Act of 1986, greater direct corporate investment in real estate would be expected, given the favorable passive loss offset rules which apply to corporate taxpayers [I.R.C., 469(h)(4)].

In addition, corporations could also effect investment through the limited partnership form, either as a general partner or limited partner. This study assumes that the typical investor in the limited partnership is an individual taxpayer.
6. For comparison purposes, leverage percentages of 70 percent and 90 percent are also considered.
7. Data was collected on a quarterly basis.

8. In the case of low income housing investment, the internal rate of return effect from non-tax cash flows would be expected to be minimal, due to low expectations for operating income and capital appreciation. This again illustrates the dependence of privately financed low income housing on federal subsidies, both direct and indirect.
9. Subsidy data for these three programs was available only on an annual basis.
10. This rating is based on the evaluation of Moody's Investor Services.
11. To properly assess the effects of variation of the assumptions supporting the standard case housing project, two additional sets of assumptions were considered. The first additional set was designed to produce rates of return at the high end of the possible return spectrum, while the second additional set was designed to produce rates of return at the low end of the return spectrum. These assumptions are described in the Explanation of References following Table 3-2. Each variation is accompanied by an indicator of (High) or (Low).

CHAPTER IV RESEARCH METHODOLOGY

Introduction

This study examines the effect of tax incentives on low income, multifamily housing starts. This relationship is estimated through the use of two economic models. First, an internal rate of return model is developed to assess the effects of tax incentives on returns from investment in low income housing, over the test period of the study, 1970-1985. Second, a multivariate regression equation is utilized to estimate the effects of these rates of return, in addition to certain other economic variables, on actual low income housing investment.

The previous chapter described the factors supporting the use of these two models in the estimation of investment effects of tax changes. This chapter details the actual use of the two models in estimating the variables of interest, namely the rates of return on investment and the parameters of the investment equation. This chapter also discusses the statistical methodology utilized to estimate the investment equation and the underlying assumptions of the methodology and appropriate tests of such assumptions.

Specification of Economic Models

Internal Rate of Return

As is true with most economic phenomena, the actual economic relationship between low income housing starts and rate of return is not known, since many different variables may influence the investment decision. However, most economic theorists would probably agree that the rate of return available from investments in low income housing is certainly a major factor, if not the primary factor, in the investment decision. Accordingly, this study adopts the internal rate of return on investment as the primary variable supporting investment in low income housing, and posits a functional relationship between low income housing starts and specific rate of return variables, which are described in the following section.

To properly examine the research questions of interest, the internal rate of return model was utilized to generate six different forms of investment return. First, an overall after-tax rate of return was calculated for each quarter of the test period, which incorporated all tax and nontax variables. Second, this overall return was dichotomized into two basic components, a tax component and a nontax component. Although the primary variable of interest in this study was the tax component, other nontax variables affect investment return, and thus may affect the investment decision. Each of these three forms of investment return was further divided

into two components, a "nominal" component and a "return premium" component. The nominal component was the initial value generated from the application of the internal rate of return model. The return premium component was separately calculated as the difference between the nominal component return and the rate of return available from an investment in tax-free municipal bonds. This difference was calculated as an estimate of the excess return (if any) available from an investment in low income housing in relation to a relatively low-risk return. In addition, each of these returns was estimated under two separate assumptions for the inflation rate applicable to operating expenses and rental income.¹ The above described segregation of the various rates of return can best be illustrated by the following diagram:

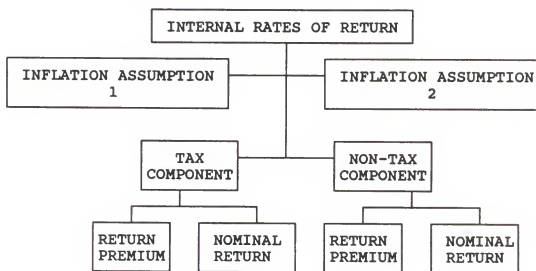


FIGURE 4-1

Summary of Internal Rate of Return Classifications

In total, six rates of return were developed for each of the 64 quarters in the test period, under each of the two inflation assumptions.

Investment Equations

The underlying research question examined in this study was the effect of tax incentives on investments in low income housing. To assess this effect, the rate of return variables generated in the first part were utilized as independent variables in an investment equation, the nature of which was described in detail in the previous chapter. The basic form of the equation is restated as follows, together with alternative specifications which are also tested.

The number of low income housing starts for a particular quarter is hypothesized to be a function of the internal rate of return on investment, the level of direct governmental subsidy, and the rate of return available from a low-risk alternative investment (Aaa, tax-free municipal bonds were used in this study). The rate of return variable in this study was specified in several different forms. The primary purpose of this research is to determine the effect of the tax component of the rate of return on investment in low income housing. Thus, the total rate of return on investment, as described above, was dichotomized into a tax component and a non-tax component, as follows:

$$\text{STRT}_t = \beta_0 + \beta_1(\text{TXRT}_{t-2}) + \beta_2(\text{NTX}_{t-2}) + \beta_3(\text{DSUB}_t) + \beta_4(\text{DSUB}_t)(\text{TXRT}_{t-2}) + \beta_5(\text{ALRT}_{t-2}) + \epsilon$$

where,

- STRT_t = number of multifamily subsidized housing starts during period t .
- TXRT_{t-2} = tax effect component of the internal rate of return on investment in low income housing for period $t-2$, expressed on a real rate of return basis.
- NTX_{t-2} = non-tax component of the internal rate of return on investment in low income housing for period $t-2$, expressed on a real rate of return basis.
- DSUB_t = level of direct subsidy provided to multifamily subsidized housing for period t .
- ALRT_{t-2} = average return available on tax-free, long-term Aaa municipal bonds for period $t-2$, expressed on a real rate of return basis.
- ϵ = residual term with zero expected value and zero correlation with the explanatory variables.
- β_0 = intercept term
- β_i = parameter estimates ($i = 1$ to 5)

In addition to the basic investment equation shown above, other specifications of the equation were also estimated. The purpose of these alternative investment specifications was twofold. First, it is uncertain to what degree investors actually utilize rate of return variables in their investment decision. The basic form of the equation assumes a dichotomization of the rate of return variable into tax and nontax components, under the assumption that tax effects drive

the investment decision. However, it would be naive to suggest that this is the exact form of the equation utilized by investors in their investment decision. Therefore, a separate equation was estimated that tests the effects of the overall rate of return on investment, rather than dichotomized returns. Further, the effect of the return premiums on investment, as estimated in the first part of the study, were included as separate independent variables in another form of the investment equation.

Research Questions and Hypotheses

The research questions examined in the study are restated as follows:

- (1) Over the period 1970-1985, what is the effect of federal tax incentives on multifamily, low income housing starts?
- (2) Over the period 1970-1985, what is the economic relationship between federal tax incentives for low income housing and direct subsidies for low income housing?
- (3) Over the period 1970-1985, what is the economic relationship between returns available on a low-risk asset and investment in multifamily, low income housing?

These research questions are restated in the form of testable hypotheses as follows:

- H_1 : Over the period 1970-1985, the effect of tax incentives on investment in multifamily low income housing is equal to zero.

H₂: Over the period 1970-1985, there was no economic relationship between the availability of tax incentives and direct subsidies for multifamily low income housing.

H₃: Over the period 1970-1985, there was no economic relationship between returns available on tax-free municipal bonds and the investment in multifamily, low income housing.

The first hypothesis addresses the primary and most fundamental issue of the study, i.e., whether the providing of tax incentives has significantly affected investment in multifamily low income housing units, where investment is measured by the number of units of low income, multifamily housing started during a particular quarter of the test period. The test of this hypothesis is equivalent to testing whether β_1 is equal to zero.

Effectively, this hypothesis represents a test of Congressional tax policy as developed for low income housing. The provision of favorable tax incentives to investors in low income housing developments was an attempt by Congress to motivate additional low income housing construction. If tax incentives were a significant factor in increasing the number of housing starts, we would expect a significant positive coefficient for this variable. A non-significant result could indicate that the reaction to the new law was positive, but non-significant, or that taxpayer behavior was unaffected by the tax law change, due to other economic factors affecting

investment returns in the low income housing market (e.g., interest rate changes), or in other markets (e.g., less risky investments).

The second hypothesis examines whether tax incentives affect low income housing starts only in conjunction with the level of direct governmental subsidy provided for low income housing projects. The test of this hypothesis is equivalent to testing whether the coefficient β_4 is equal to zero.

The importance of this second hypothesis relates to the perception of the actual value of tax incentives by potential investors. In design, a tax incentive would be expected to stand alone in terms of affecting economic behavior, i.e., its value would not depend on the existence of other forms of economic incentive. In the case of low income housing, direct subsidies were prevalent in the 1960's and 1970's as compared to tax incentives. Only in the 1980's, when the level of direct governmental subsidy for low income housing showed a large decline have tax incentives for such housing occupied a role of major importance.

Thus, the question becomes to what extent potential investors relied on tax incentives in developing their investment decision, i.e., were tax incentives the major factor which prompted their capital commitment to low income housing, or were such incentives attractive at the margin, given a certain expected level of direct governmental subsidy for low income housing programs? This question can be best

illustrated by a simple matrix of different possible scenarios among tax incentives and direct subsidies for low income housing, as shown in Figure 4-2.

LEVEL OF DIRECT SUBSIDY	LEVEL OF TAX INCENTIVES	INVESTMENT EFFECT
HIGH	HIGH	POSITIVE
HIGH	LOW	POSITIVE
LOW	HIGH	?
LOW	LOW	ZERO

Figure 4-2
Relationships Between Direct Subsidy, Tax Incentives and Investment

In the above matrix, the expected level of investment under different levels of direct subsidy and tax incentives for housing is compared. We assume that when sufficient (high) levels of direct governmental subsidy are present, investment in low income housing takes place, as was the case in the 1960's and the majority of the 1970's, when tax incentives for new low income housing were minimal. However, when low levels of direct subsidy are present, the investment effect is unclear, except when accompanying tax incentives are also low, in which case the expected investment level would also be minimal.²

The effect of providing tax incentives without an accompanying high level of direct subsidy is essentially the

also be minimal.²

The effect of providing tax incentives without an accompanying high level of direct subsidy is essentially the subject addressed by the second research question. If low income housing tax incentives were viewed as significant by investors over the test period (i.e., equivalent to a comparable level of direct subsidy), then a significant result for the interaction coefficient would be expected. A non-significant result for this coefficient could imply that tax incentives were either not sufficient to generate additional low income housing investment, or viewed differently than direct subsidies by investors. Of course, this would be counter to Congressional intent in drafting tax legislation favoring low income housing, since these incentives were expected to motivate new production of housing even during a period of declining direct subsidies.

The third hypothesis examines whether the level of investment in low income housing is affected by returns available in an alternative investment market. This study utilizes returns on tax-free, Aaa municipal bonds³ to represent alternative returns, due to their relatively low risk and measurement on an after-tax basis. Essentially, returns from high-grade municipal bonds represent an investment opportunity at the opposite end of the risk spectrum from low income housing. This provides an

interesting dichotomy in terms of investor perception of risk-adjusted returns.

The research importance of this third question relates directly to the goal of Congress in motivating additional low income housing through the use of tax policy. The actual value of an investment return must be considered on a basis relative to those available from the set of alternative investments. Thus, the increased return on a particular investment (e.g., low income housing) resulting from a new tax provision does not in itself represent increased value to potential investors. Only if this increased return provides a sufficient premium over alternative returns on a risk-adjusted, after-tax basis can we conclude that the incentive possesses actual value. We would expect a negative relationship between municipal bond returns and low income housing starts, *ceteris paribus*. However, if the investment return premium available from low income housing tax incentives was sufficient, this negative relationship would not necessarily exist.

The test of the third hypothesis is equivalent to testing whether the coefficient β_3 is equal to zero.

Statistical Methodology

Model Specification

The regression equation was derived using a linear specification of the variables and parameters. In general, the linearity assumption is valid unless specific evidence regarding the relationships between the variables indicates that a non-linear relationship is more appropriate. In this study, no evidence was available to suggest a non-linear form for the investment models examined. In addition, from a statistical perspective, the linearity assumption allows for use of more refined estimation techniques, which are explained below.

Parameter Estimation

The equation's parameters were estimated using the method of ordinary least squares. The least squares methodology involves estimation of the coefficients of the explanatory variables such that the error terms (residuals) of the model are minimized, where the error term is defined as the observed value of the dependent variable minus the predicted value of this variable. The ordinary least squares methodology was selected based on specific properties which it possesses in relation to other estimators, which are described as follows:

Unbiasedness. The bias of an estimator is defined as its expected value minus the true value of the parameter. An estimator is unbiased if the bias is zero. The ordinary least

squares estimator is a linear unbiased estimator (i.e., $E(b) = \beta$) (Johnson, 1984).

Minimum variance. The variance of the distribution of the estimator measures the spread of the distribution about the mean value of the estimator. Statistically, the smaller the variance, the more precise are the inferences which can be made about the parameter to be estimated. According to the Gauss-Markov theorem, least squares estimators have minimum variance in the class of linear unbiased estimators, and thus are best linear unbiased estimators (Johnson, 1984).

Assumptions of the Linear Model And Related Tests⁴

Use of the linear model for regression analysis using ordinary least squares is based on several assumptions related to the form of the model and the underlying data. These assumptions, together with a description of the appropriate tests of such assumptions, are presented below. The actual tests of the assumptions are discussed in Chapter Five.

1. The vector of Y observations can be expressed as a linear combination of the explanatory variables (X), plus a disturbance term, u . The assumption of linearity is generally tested by a plot of the residuals against the explanatory variables, or by a scatter plot of the observed values of the dependent variable against the explanatory variables.
2. The expected value of the disturbance term, u , is zero. This indicates that on average, positive and negative

differences from the expected value of the parameter will occur, and will average out to zero.

3. Each u distribution has the same variance. The true disturbance term is not known, but its value can be estimated by calculation of the residual (e). The homogeneity of the variances can be investigated through a plot of the residuals against each value of the independent variables.
4. All disturbances are pairwise uncorrelated. When using time series data for estimation purposes, there exists the potential of autocorrelation among the residuals (i.e., the residuals are not independent, thus violating a basic assumption of ordinary least squares). When the error terms are independent, the residuals should fluctuate fairly randomly around their mean of zero, showing little correlation with preceding values. The presence of autocorrelation produces ordinary least squares estimates which are not efficient and which are biased, since the variance of the estimates are incorrectly estimated, which thus generates misleading t -statistics.

A test of serial correlation among the residuals is provided by the Durbin-Watson statistic (D), which is calculated using the residual values as follows:

$$D = \frac{\sum_{t=2}^n (e_t - e_{t-1})^2}{\sum_{t=1}^n e_t^2}$$

where n is the number of observations and e_t is the calculated value of the residual at period t . The calculated Durbin-Watson value is compared to established upper and lower bounds (based on the sample size and number of explanatory variables) to establish whether an autocorrelation parameter (ρ) exists. For small values of D , the hypothesis of $\rho > 0$ is supported, since this indicates small differences in the residual values over time.

Several remedial measures are available when serial correlation is present [Neter et al., 1985]. The serial correlation problem may exist due to omission of independent variables which affect the dependent variable over time. Alternatively, transformations of the variables may be utilized.

This study utilizes the SAS AUTOREG procedure to test for and remedy any autocorrelation problem detected in the data. This procedure estimates the parameters of the regression equation by assuming the error term is an autoregressive process of a specified order (p). The AUTOREG procedure first estimates the regression equation using the method of ordinary least squares. Next, successive calculations of the autocovariances of the residuals are performed, up the level

of the lag (p) specified in the procedure. Estimates are then made of the autoregressive parameters, which are used to transform the original data. Using this transformed data, new estimates are made of the regression parameters.⁵ These new estimates then conform to the ordinary least squares assumptions, and contain the unbiased/minimum variance properties (Delong & Sall, 1982).

The SAS program allows the user to specify the desired level of the lag operator for which calculations of the autoregressive parameter are made. These estimates can then be used to determine the order of the autocorrelation (e.g., first order, second order, etc.), by the level of significance of each succeeding order.

5. The matrix of X variables is nonstochastic (i.e., $E[e_t X_t] = 0$).
6. The u vector has a multivariate normal distribution. This assumption is generally valid unless specific evidence is present indicating that errors due to omission of independent variables and measurement errors are significant or not independent of each other (Ostrom, 1978). The normality assumption is generally tested through a normal probability plot of the residuals.

Chapter Five contains the estimation and analysis of the rate of return variables under the different assumptions employed in the study. Also, the estimation of the parameters of the investment equation are presented in Chapter 5,

together with a discussion of the statistical tests performed related to the estimation procedures utilized.

Notes

1. The two assumptions for the inflation percentages applicable to rental income and operating expenses were (1) three percent and four percent, respectively, and (2) zero percent for rental income and operating expense. See Chapter 3 for a further discussion of these assumptions.
2. Investment in low income housing may still take place in the absence of direct federal subsidies or federal tax incentives, due to the possibility of local or state subsidies. These subsidy forms are not considered in this study.
3. These returns are expressed on a real rate of return basis, by adjustment for the periodic inflation rate, determined using the GNP price deflator.
4. Johnson, 1984, and Neter et al., 1985.
5. For a complete explanation of this transformation procedure, see SAS/ETS User's Guide: Econometrics and Time Series Library (1982), p. 190-191.

CHAPTER V ANALYSIS OF RESEARCH RESULTS

Introduction

The previous chapter discussed the development of the economic models utilized in this study to generate the rate of return data and examine the proposed research hypotheses. This chapter describes the results provided by the application of these models, including a detailed analysis of the rate of return estimations over the test period and the related estimates of the parameters of the investment equation.

To address the proposed research questions, this study utilized two economic models. First, to estimate the impact of tax changes on internal rates of return from investment in low income housing, a standard case investment project was formulated, and applied to an internal rate of return model developed using the Lotus 1-2-3 software package. Second, an investment equation was estimated to test the impact of these internal rates of return on actual low income housing investment over the test period of the study.

The analysis of the research results which follows will proceed along these two dimensions. Part One presents an analysis of the results of the rate of return estimation employed for the test period 1970-1985, including an analysis

of the response of rates of return to tax changes enacted over this period, important trends in the returns, and potential implications of these results.

In Part Two, the rates of return developed in Part One of the analysis were utilized as input variables for the investment equations, in order to develop inferences regarding the investment effects of tax changes, as they apply to low income housing. This second part presents the results of these parameter estimations, together with an analysis and interpretation of the results.

The investment relationship was examined under several alternative assumptions, and over several different time periods, to measure any differential effects, the nature of which are addressed in this second part of the study.

Clearly, in conducting any econometric analysis of tax policy, one must proceed with caution in drawing specific inferences, due to the presence of data limitations and potential omission of economic variables from the investment equation which may affect investment behavior. Under basic economic theory, taxes would be expected to influence economic behavior. However, the behavior of individuals at any point in time is a function of numerous variables, all of which cannot possibly be incorporated perfectly into a specific equation. The goal of this research is to capture to the extent possible the effects of the variable of interest, in this case taxation, on investment behavior. As in other

studies, the results must be considered with the normal research limitations in mind.

Research Results

Part One: Internal Rate of Return Analysis

Overview

The internal rate of return measures utilized in this study were formulated from a standard case low income housing investment project. In addition, the assumptions supporting this standard case model were varied to produce two additional investment projects, for comparison purposes. Internal rates of return were generated on a quarterly basis over the test period of 1970-1985. Each quarterly after-tax return was segregated into two elements. First, the rates of return produced by the investment project's nontax elements (e.g., rents, operating expenses, property appreciation) were estimated. Second, the effect on tax specific variables on each rate of return (e.g, tax rates, depreciation provisions, interest deductions) was estimated. In addition to dichotomized rates of return, the total after-tax rate of return (IRR), without decomposition into the tax and nontax elements, was considered as an independent variable in a separate regression equation, although not concurrently with the tax and nontax return elements. In addition, each rate of return was further utilized to estimate a "return premium" available from investments in low income housing. This return premium was defined to be the excess of the quarterly low

income housing investment return over the return available from tax free municipal bonds during the same quarter.

Many additional factors can be suggested which may impact investment in low income housing. The primary goal of this research was to test the effect of tax variables on these investment decisions. However, investment in low income housing has occurred in years without specific tax preferences for such housing. This investment can be attributed to other economic benefits available to investors, such as direct subsidies provided by federal, state and local governmental units. In addition, competing investments may affect the level of investment in low income housing at any point in time. To account for these effects, two nontax variables were included in the investment equation, specifically the level of direct federal subsidy and the rate of return from municipal bonds. A limitation of direct rate of return analysis as it is employed in this and other similar studies is the omission of implicit economic factors which potentially affect the dependent variable of interest, i.e., low income housing investment. For example, during the test period of this study, several changes in the tax law occurred which affected investment returns not only from low income housing, but also other forms of real and personal property. In addition, certain tax changes were enacted during the test period which affected only real property investments other than low income housing investments. Changes in returns from

other investments implicitly changes low income housing values, since given a fixed pool of investment dollars, the increase or decrease in investment returns from competing investments affects the value of low income housing from the perspective of investors. However, to properly consider these implicit effects, a researcher is again confronted with the problems of variable measurement and statistical power, since (1) it is difficult to conceptualize much less quantify the effects of competing investment returns on a given activity, and (2) a limited number of degrees of freedom are generally available in such a study. The existence of this problem does not discount the value of direct rate of return analysis, but does indicate that an econometric analysis of economic phenomena such as low income housing investment must be considered with such factors in mind.

Analysis

To properly analyze the rates of return produced by the internal rate of return model, it is first appropriate to review the nature of the tax changes occurring during the test period which potentially affected the rates of return on low income housing investment. First, during the test period of the study, 1970-1985, six different tax laws were enacted which in some form affected investment in real property, as well as other investment forms. The major provisions of these tax changes were generally effective in 1970, 1977, 1979, 1981, 1982, and 1984. In addition, certain changes in

depreciable lives of non-low income housing property were enacted during 1984 and 1985 which affected the returns from these properties. Also, major tax changes affecting real property investment were enacted as part of the Tax Reform Act of 1986, but which were not included in the test period of this study, for reasons previously discussed.

Not all tax changes implemented by the six tax acts directly affected low income housing investment returns, and some acts affected low income housing returns more dramatically than others. For example, the substantial reforms of the cost recovery provisions and tax rates enacted as part of the 1981 Economic Recovery Tax Act probably had the greatest impact on real property investment returns, since cost recovery generally provides a major portion of the investment return. On the other hand, the 1984 Tax Act had no direct effect on low income housing.

In Table 5-1 to follow, the average rates of return for each of the major tax regimes in effect during the test period are presented. This tabular data is reconstructed in graphical form in Figure 5-1, to aid the reader in appreciating the magnitude of tax changes during the test period. The most important feature of this table is probably the degree of change in returns from one tax act to another, which reflects the intent of Congress in encouraging or discouraging investment in low income housing. Over the years, low income housing, particularly as compared to other

forms of real property investment, has been the recipient of very favorable tax incentives, which again is rooted in the basic desire of Congress to encourage residential construction, particularly for lower income individuals. In reviewing rates of return from low income housing investment, this favorable tax treatment is evident in most tax periods by an increase in the tax component of the internal rate of return. However, tax benefits as designed by policy makers cannot be considered in a vacuum. If countervailing economic forces act to negate or lessen the value of the tax change itself (e.g., the presence of higher interest rates or complementary benefits provided to competing investments), then the overall value of the tax change may be mitigated in terms of achieving the desired result, which in this case is new housing investment.

In Table 5-1, the rates of return under the first inflation assumption are presented, in nominal terms. These values are based on annual inflation factors of three percent for operating income and four percent for operating expenses, the basis for which are discussed in the previous chapter.

Table 5-1
Average Internal Rates of Return¹
Nominal Basis

<u>Time period</u>	<u>Nontax Component</u>	<u>Tax Component</u>	<u>Total IRR</u>
1970-1976	0.0855	-0.0072	0.0782
1977-1978	0.0733	0.0004	0.0737
1979-1980	0.0251	0.0361	0.0612
1981:Qtrs. 1&2	-0.0090	0.1597	0.1507
1981:Qtrs. 3&4	-0.0412	0.0849	0.0437
1982-1985	-0.0262	0.0829	0.0529

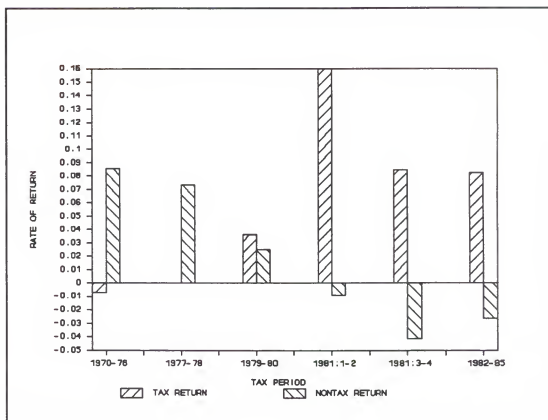


Figure 5-1
Tax vs. Nontax Returns: 1970-1985
 Nominal Basis
 Inflation Assumption 1 [3%,4%]

The tax year 1981 is dichotomized into two separate sets of returns in the above table, for the first two quarters of the year and the last two quarters. This is due to certain tax changes enacted by the 1981 Tax Act which were effective in the middle of 1981. The change in ordinary income rates took effect at the end of the year, although new capital gains rates were effective after June 1981. Therefore, the rates of return were substantially different due to these changes, and thus both periods were separately calculated.

An analysis of these returns suggests several important points. The first is the relatively low level of returns provided by tax benefits during the 1970-1976 period. This is due primarily to the absence of direct tax benefits for new low income housing during this period. The Tax Reform Act of 1969 instituted tax incentives for rehabilitation of existing low income housing, but did not provide related incentives for new low income housing. The primary tax benefits for such housing during this period were the interest deduction and capital gains deduction, which were also available to other real property investments. Another factor affecting this low tax component return for the 1970-1976 period is the level of interest rates. Interest rates for this period remained for the most part in the 7.5-8.5 percent range, which in consideration of the overall period of this study, were relatively low. Lower interest rates result in lower interest deductions, which reduces the tax component of the internal rate of return. However, these lower rates concurrently raise the value of the nontax operating rate of return, due to the lower periodic cash outflow for interest payments. The cash outflow due to the tax on net capital gains realized through property appreciation and operating income thus dominated the tax value of interest deductions during this period, which produced a net negative internal rate of return for the tax component.

The tax component return as a ratio of the total after-tax return during the 1970-1976 period was effectively zero, since the tax component return was negative. It appears obvious from reviewing these rates of return that tax benefits added little investment incentive for new low income housing during the 1970-1976 period. The primary support for low income housing during this time period was provided by direct housing subsidies, and by investment returns available from the operating (nontax) components of the property itself, which as can be seen in the above data are relatively high, which again is due to the relatively low level of interest rates which existed during this period.

Second, the tax changes instituted by the 1976 Tax Reform Act also had little effect on low income housing investment returns, as is evident in Table 5-1. The only major change in the tax laws from this act which affected low income housing was the tighter restriction on depreciation recapture. Prior to the 1976 Act, if low income property was held greater than 120 months, no recapture of depreciation applied. The 1976 Act altered this provision, such that if low income property was held greater than 200 months, no depreciation recapture applied. This had little direct effect on low income housing investment returns, since an analysis of the underlying data disclosed that the assumed holding period to maximize the return did not change as a result of this act. This does not indicate, however, that this change had no

effect on low income housing investment. Certain investors may still have altered their investment decision due to the more stringent recapture rules instituted by this act. It should also be noted that this act also required the recapture of all depreciation allowable on other forms of real property, which as mentioned previously, effectively produced an implicit benefit for low income housing not reflected in its investment return.

The increase in the average tax component return, from a negative value of 0.0072 during the 1970-1976 period to a positive value of 0.0004 during the 1977-1978 is slight, and is due only to the slightly higher interest rates which existed during the 1977-1978 period. The level of interest rates during this period averaged about 8.8 percent, a small increase from pre-1977 rates. This had the effect of decreasing the nontax component of the return, but increasing the tax component. The tax component return provided slightly more than one-half of one percent of the total after-tax return during this period, which would appear to be insignificant in terms of altering economic behavior. The important point is that the tax laws apparently provided little additional incentive to potential investors in low income housing during this period.

The Revenue Act of 1978 introduced a major change in the tax law which produced a fairly substantial percentage increase in the tax component of the rate of return on

investment in low income housing, although the total magnitude of this increase was not dramatic. The effect of this change, among other factors, is reflected in the rates of return for the 1979-1980 period, as shown in Table 5-1. The tax component return increased from 0.0004 to 0.0361 during this period.

This tax act increased the capital gains deduction for net long-term capital gains from fifty percent to sixty percent. Since the maximum individual income tax rate during this period was seventy percent, this change had the effect of reducing the net tax on long-term capital gains from thirty-five percent (i.e., $.7 \times .5$) to twenty-eight percent (i.e., $.7 \times .4$). This represents a twenty percent reduction in the tax rate on capital gains.

Of the total investment return available from low income housing during this period [0.0612], the tax component occupies a much larger position (over fifty-nine percent), as compared to the percentage of total return under prior law. A portion of this increase in the tax component return is due to the higher level of interest rates during the 1979-1980 period. Interest rates averaged close to eleven percent during 1979-1980, which increased the tax value of the interest deduction, although at the same time reducing the nontax component of the investment return, due to higher interest payments.

Overall, the total investment return decreased approximately seventeen percent from the 1977-1978 period, due primarily to the higher after-tax interest costs which existed during these years. These higher interest costs dominated the increased capital gains benefits available under the new law.

The 1981 Tax Act represented the first major effort of Congress to stimulate investment spending in all forms of real investment property, not only low income housing, although low income housing was the recipient of more favorable tax benefits from this act. The major tax benefit provided to low income housing from this act was the substantial shortening (i.e., over fifty percent reduction) of the recovery period for depreciable investment costs, together with the allowance of accelerated depreciation for these costs. The value of these provisions, in terms of rate of return effects, is reflected in Table 5-1.

The tax component of the investment return increased from 0.0361 from the period preceding the 1981 Tax Act to 0.1597 during the first two quarters of the 1981 Tax Act, which represents an increase of over three hundred percent. In addition, the tax component return dominated the total investment return during this period, since rising interest rates produced a net negative return for the nontax component [-0.009]. The total investment return increased from 0.0612 to 0.1507 as a result of the generous tax benefits provided

by the 1981 Tax Act, which represents an increase of over 140 percent. These increases are dramatic, particularly as compared to prior years' changes, and clearly reflect the intent of Congress in drafting this legislation.

During the last two quarters of 1981, the tax component return decreased from previous levels, due primarily to the lowering of the maximum ordinary income tax rate from seventy percent to fifty percent.² Since real estate investment projects such as this one were designed primarily to produce tax losses, the lowering of the tax rate reduces the value of certain tax benefits, since a larger percentage of generated investment losses is borne by the investor rather than the government. However, the returns available during the last two quarters still represent a large increase over pre-1981 act returns. For example, the tax component return during the last two quarters averaged 0.0849, which represents an increase of over 130 percent from the pre-1981 act returns. Also, the tax component return dominated the total investment return during these last two quarters of 1981, since the nontax return was negative during this period.

During the last four years of the test period, 1982-1985, the tax component return decreased slightly from pre-1982 levels. The tax component returns during this period averaged 0.0829, a decrease of only about two percent from the third and fourth quarter levels of 1981. Non-tax returns increased from a negative 0.0412 in the pre-1982 period to a negative

0.0262 during 1982-1985, which represents an increase of about thirty-six percent. The total investment return during the 1982-1985 period averaged over five percent, which represents a slight increase over pre-1982 returns. Again, the tax component return was the dominant element in the total investment return during this period.

As discussed previously, rates of return are only meaningful when considered on a relative basis, in comparison with other competing returns. In this study, the rates of return available from investment in tax free municipal bonds were included as a measure of these competing returns, since they occupy a low risk position on total continuum of alternative investments. To properly analyze low income housing returns in comparison with these bond returns, a set of return premiums was calculated by subtracting the tax free bond returns from the "nominal" returns detailed in Table 5-1. Essentially, this result is a measure of the return premiums available from investment in low income housing over the test period. To motivate investors to commit economic resources to low income housing, this return premium must be of a sufficient magnitude to redirect investment from an almost guaranteed municipal bond return to a more risky investment return from low income housing. Without a sufficient return premium, there would be little incentive to shift investment into more risky economic ventures such as low income housing.³

The results of this return premium analysis are presented in Table 5-2. These results are also presented graphically in Figure 5-2. In this table, the differences between low income housing returns (tax and nontax) and the returns available from Aaa, tax-free municipal bonds are presented.

Table 5-2
Average Internal Rates of Return⁴
Return Premium Basis

<u>Time period</u>	<u>Nontax Component</u>	<u>Tax Component</u>	<u>Total IRR</u>
1970-1976	0.0437	-0.0490	0.0364
1977-1978	0.0365	-0.0365	0.0369
1979-1980	-0.0198	-0.0087	0.0164
1981:Qtrs. 1&2	-0.0850	0.0837	0.0746
1981:Qtrs. 3&4	-0.1355	-0.0095	-0.0507
1982-1985	-0.1112	-0.0021	-0.0321

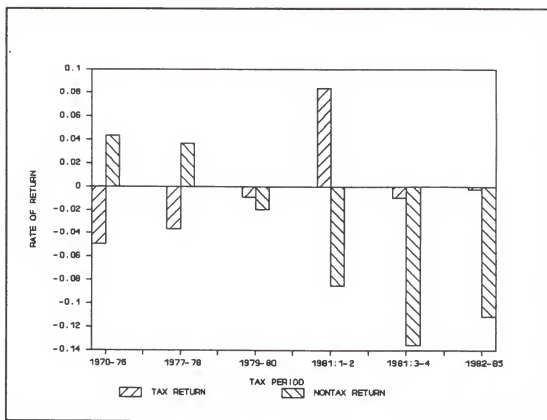


Figure 5-2
Tax vs. Nontax Returns: 1970-1985
Return Premium Basis
Inflation Assumption 1 [3%,4%]

A review of this data, particularly in comparison with the results from Table 5-1, provides rather interesting results. First, it is clear from these results that only in the first two quarters of 1981 did tax law changes appear to provide even a marginally attractive investment incentive for low income housing. During this period, the return premium averaged over eight percent, which by itself is not very informative, without actual comparison to return premiums from other risky investments. The data from Table 5-2 do appear

to support the criticism made by many housing advocates that federal tax benefits provided to low income housing were not sufficient to significantly alter investor behavior. To achieve investment reaction, larger return premiums would be expected from relatively risky, long-investments such as low income housing projects. In five of the six periods detailed in Table 5-2 (1970-1976, 1977-1978, 1979-1980, 1981:3rd and 4th quarters, and 1982-1985), the return premium for low income housing is negative, which is opposite the result desired by policy makers in their efforts to motivate new low income housing development through changes in the tax laws. The return premium in 1981:1st and 2nd quarters is positive, but again the actual incentive value of these return premiums is uncertain when considered individually.

As described in a prior chapter, rate of return analysis has several limitations, one being the number of assumptions which must be incorporated into the investment model, particularly for projects with relatively long lives, such as real property investment. One assumption made in all studies of real property investment returns is the rate of inflation applicable to project income and operating expenses. Sufficient justification appears to exist for the three percent and four percent annual inflation factors applied to rental income and operating expense, respectively, which was discussed previously. However, it would be naive to suggest that such percentages are utilized by all investors. One

could raise the argument that inflation percentages should not be factored into rate of return analysis, due to their extreme unpredictability and subjectiveness, and thus the project should be examined based on its other economic attributes, such as tax effects. To consider this possibility, the rate of return model utilized in this study was designed to examine other inflation assumptions. Specifically, the assumption of zero inflation applicable to operating income and expenses was considered as a separate case. Certainly, numerous other assumptions could be examined, but one could not state with certainty which one was most appropriate. The three percent/four percent factors examined under the first case certainly appear reasonable, but these values are by no means absolute, since no researcher can accurately forecast future economic events such as inflation. Thus, the zero percent assumption for inflation was considered not as a true simulation of future investment returns, but as a comparison to the positive inflation scenario employed in the first case, and as a measure of returns under an environment where pure tax factors are isolated to a greater extent, without being confounded by inflation effects.

The results of this zero inflation assumption are presented in Table 5-3, which follows, using the same format as Table 5-1. Figure 5-3 presents the same results in graphical form.

Table 5-3
Average Internal Rates of Return⁵
Nominal Basis

<u>Time period</u>	<u>Nontax Component</u>	<u>Tax Component</u>	<u>Total IRR</u>
1970-1976	0.0649	0.0034	0.0683
1977-1978	0.0523	0.0111	0.0634
1979-1980	0.0085	0.0456	0.0541
1981:Qtrs. 1&2	-0.0264	0.1678	0.1414
1981:Qtrs. 3&4	-0.0589	0.0879	0.0290
1982-1985	-0.0475	0.0860	0.0385

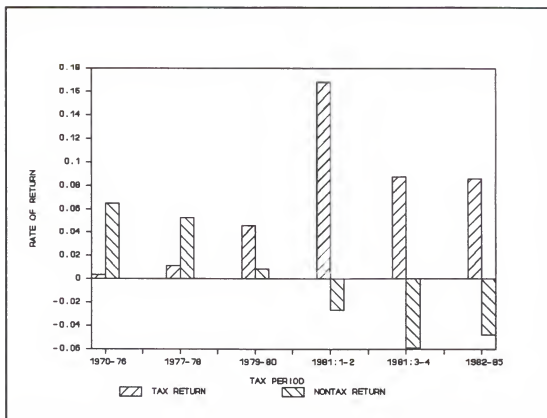


Figure 5-3
Tax vs. Nontax Returns: 1970-1985
Nominal Basis
Inflation Assumption 2 [0%,0%]

The results from the zero inflation assumption closely parallel those from the first case. The primary difference is the level of the tax component return, which in the zero inflation case is slightly higher than the positive inflation case. This is due to the taxation of net project income at a positive rate. In the case of positive inflation, this net project income is increasing, and thus cash outflow due to taxation is increasing, resulting in the slightly lower tax component returns. In the zero inflation case, tax rates are

applied to a constant net project income, producing lower tax liability, and thus a higher tax component return.

As in the positive inflation case, the tax component return provides very little addition to the total after-tax return in the years 1970-1976, where the ratio of tax component return to total after-tax return is only about five percent. This ratio increases to over seventeen percent in the 1977-1978 tax years, again due to the lowering of the effective tax rate on capital gains. This ratio of tax component return to total after-tax return increases substantially during 1979-1980 to a level of over eighty-six percent, which is a function of both a lower nontax return component resulting from higher interest rates and an increased tax return component. As in the positive inflation case, the 1981 tax act produced the most dramatic increase in the tax component return, both in comparison to the prior years and in proportion to the total investment return. In the first two quarters of 1981, the tax component return provides one hundred percent of the positive return, due to a negative nontax return component during this high interest rate period. In comparison with the prior years' tax period, the tax component return increased over 267 percent, due to the major tax changes instituted under the 1981 tax act. Also, as in the positive inflation case, the tax component return decreased sharply during the last two quarters of 1981, due to the lowering of the ordinary income tax rate. In the

zero inflation case, this decrease in the tax component return was over forty-seven percent. The tax return component decreased only slightly (less than three percent) during the 1982-1985 tax period, as compared to the prior tax period.

The nontax and tax component return values were also recalculated in the zero inflation case using the return premium concept, which is described above, to assess the return premium offered by tax and nontax factors during the test period. These results are presented in Table 5-4, which follows, together with Figure 5-4, in graphical form.

Table 5-4
Average Internal Rates of Return⁶
Return Premium Basis

<u>Time period</u>	<u>Nontax Component</u>	<u>Tax Component</u>	<u>Total IRR</u>
1970-1976	0.0231	-0.0384	0.0265
1977-1978	0.0162	-0.0257	0.0266
1979-1980	-0.0364	0.0008	0.0093
1981:Qtrs. 1&2	-0.1024	0.0918	0.0654
1981:Qtrs. 3&4	-0.1533	-0.0065	-0.0654
1982-1985	-0.1325	0.0010	-0.0464

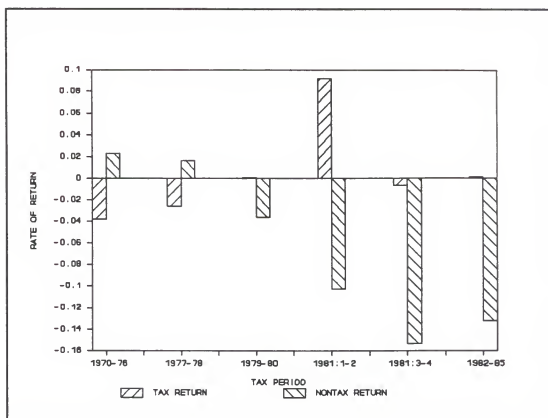


Figure 5-4
Tax vs. Nontax Returns: 1970-1985
Return Premium Basis
Inflation Assumption 2 [0%,0%]

Basically, the results from this zero inflation assumption appear to offer no additional information to the results derived in the positive inflation case, as presented in Tables 5-1 and 5-2. The tax component returns are slightly higher in the zero inflation case in each of the six tax periods, as would be expected due to the constant level of operating income under zero inflation. These tax component returns are negative in three of the six periods, as compared to five of six in the positive inflation case. However, the

positive tax component returns are substantial only during the first two quarters of 1981, where the return premium is over nine percent, which is similar to the results obtained in the positive inflation case.

Other Assumptions

The internal rates of return were also estimated under two separate sets of assumptions relating to the low income housing project. Rates of return were re-estimated under a "high" tax return component assumption and a "low" tax return component assumption, by varying certain of the housing project assumptions. These two additional sets of returns were included in the study in order to examine whether the adoption of different assumptions for project variables substantially affects investment returns. If returns are substantially different under these alternative assumptions, investor behavior may be better explained. For example, depending on the particular area of the country where the housing project is located, variables such as property appreciation, rental income, etc. may differ to such a degree that the underlying internal rates of return are substantially different.

The alternative project assumptions were detailed in Table 3-2 of Chapter III. The rates of return under both the "high" return and "low" return assumptions were estimated under the original inflation assumptions, (i.e., 3 percent annual increase for rental income and 4 percent annual

increase for operating expenses). The new returns were estimated only in the nominal form, since the principal purpose for this additional analysis was to assess the magnitude of any differences in returns from the original assumptions. The results of these estimations are presented in Tables 5-5 and 5-6, which follow.

Table 5-5
Average Internal Rates of Return⁷
Nominal Basis
High Tax Component Return Assumptions

<u>Time period</u>	<u>Nontax Component</u>	<u>Tax Component</u>	<u>Total IRR</u>
1970-1976	-0.1023	0.0527	-0.0496
1977-1978	-0.1323	0.0577	-0.0746
1979-1980	-0.3757	0.1403	-0.2354
1981:Qtrs. 1&2	-0.1742	0.2344	0.0602
1981:Qtrs. 3&4	-0.3394	0.4550	0.1156
1982-1985	-0.0915	0.0326	-0.0589

As indicated in Table 5-5, the variation in the assumptions supporting the housing project used in this study produced substantial differences in the internal rates of return. In every period, with the exception of 1982-1985, the tax component return was substantially higher than that under the first assumption set. For example, during the first two quarters of 1981, the tax component return increased from .1597 under the original assumptions to .2344 under the revised assumptions. These changes are in most part due to

the higher assumed depreciable cost as a percentage of total cost, (i.e., which was 94 percent under the revised case versus 88.7 percent originally, in addition to the increase in the leverage percentage from 80 to 90 percent. In addition, rental income as a percentage of project cost decreased from 11.7 percent under the original assumptions to 7 percent under the revised set of assumptions. Increases in other tax periods are also dramatic. The tax component return changes from a negative value in the 1970-1976 tax period under the original assumptions to a positive 5.3 percent using the revised assumptions. Changes in the returns between periods appear consistent in terms of direction with returns from the previous cases described.

It is also interesting to note the large negative effect these changes have on the nontax component return. In all cases, under the revised set of assumptions, the nontax component return has declined dramatically. This would be expected, since the changes in assumptions that produced higher tax component returns have the opposite effect on nontax returns. For example, the assumption of 90 percent leverage produces a higher tax component return due to the tax deductibility of interest. However, the use of higher leverage also results in higher interest payments, which reduces the nontax component return.

From reviewing this set of data, there is little doubt that the assumptions employed in this study of housing

investment produced a substantial impact on the internal rates of return.

In Table 5-6, which follows, the rates of return estimated under the "low" tax component return case are presented.

Table 5-6
Average Internal Rates of Return⁶
Nominal Basis
Low Tax Component Return Assumptions

<u>Time period</u>	<u>Nontax Component</u>	<u>Tax Component</u>	<u>Total IRR</u>
1970-1976	0.1241	-0.0459	0.0782
1977-1978	0.1152	-0.0395	0.0757
1979-1980	0.0911	-0.0187	0.0724
1981:Qtrs. 1&2	0.0652	0.0506	0.1158
1981:Qtrs. 3&4	0.0425	0.0823	0.1248
1982-1985	0.0490	0.0337	0.0827

As expected, the results disclosed in Table 5-6 are opposite those from Table 5-5, in that the tax component return in each case is below the amount computed under the original set of assumptions, while the nontax component return is higher in each case. The changes in the returns between tax periods are again consistent with previous cases. The large decrease in the tax component returns is due primarily to the higher assumed cost for land as a percentage of total cost. This lowers the depreciable basis for the property and thus reduces the tax benefits available. In addition, the

leverage percentage in this low return case was assumed to be 70 percent as compared to 80 percent in the original case, the effect of which is higher nontax component returns from lower interest payments, but lower tax component returns, since less interest deductions are available. Also, under this set of assumptions, rental income was estimated at 15 percent of project cost, versus 11.7 percent under the original set of assumptions. This produces higher nontax component returns due to increased rental income, but also lower tax component returns from higher tax payments on the increased operating income.

Summary and Implications

In summary, the analysis of the internal rates of return from low income housing disclosed two primary results. First, on a "nominal" basis, the direction of change in the rates of return over the six different tax regimes in effect during the test period does appear consistent in most years with Congressional intent in developing the laws. However, the magnitude of the change in the tax component returns appeared to be substantial only in 1981 and later years, as a result of the 1981 Tax Act, and was relatively small in pre-1981 years.

Over the sixteen-year period of the study, under the positive inflation assumption, the "nominal" tax component return averaged slightly less than six percent, and the return premium for the tax component return averaged close to zero.

Although not as informative as the individual returns applicable to each tax period, these average returns do highlight the substance of tax benefits available to low income housing during the 1970's and first half of the 1980's, which overall would be considered relatively poor.

Congress made a concerted attempt in 1981 to encourage investment in low income housing, and other forms of real investment property, but given the existence of high levels of interest rates during this period, the nontax return component averaged less than zero, which effectively diluted the value of the tax benefits provided. In addition, the high levels of return which existed during the first two quarters of 1981 were reduced in 1982 and later years due to the lowering of the ordinary income tax rate.

In addition, the level of direct federal subsidy to low income housing programs declined substantially after 1981, which also may have affected the perceived value of tax changes. At the margin, a tax change may have produced an increase in the rate of return which was attractive in conjunction with direct subsidies available. However, with little direct subsidy, this tax component return may have added little incentive for investors to undertake low income housing development.

Of course, a very important consideration, which cannot be determined from this data, is the relative magnitude of the rate of return effects from tax law changes in comparison

with changes in other returns (other than risk-free returns, which are included in the analysis) in the market at this time, which is a very important factor. Assuming that investors are risk-adjusted return maximizers, the degree of change in real low income housing investment returns does not indicate fully their true value to investors. However, it would be optimistic to suggest, upon review of this rate of return data, that investors would be motivated to change their investment behavior due to only a seven percent return premium over a low-risk investment such as municipal bonds, which is the case in the first two quarters of 1981. This assertion is further supported by the negative return premiums which existed during the latter two quarters of 1981 and subsequent years.

Therefore, before actually examining the low income housing investment data over the period of the study, the expectations regarding the actual investment effects of tax changes would certainly be pessimistic. We might expect some degree of reaction from the 1981 tax changes, but even in this period, given the relatively low nontax returns available from low income housing investments during this period, such reaction may have been tempered.

However, it should be noted that investment is dependent on other forms of return, for example other forms of federal subsidy, and state and local tax benefits, which also affect the total investment return. The level of direct subsidy

provided to low income housing is included as an explanatory variable in the investment equation, but not state and local benefits. To the degree that these benefits affected investment behavior during the test period, the results presented in this study may be understated.

Since the rate of return structure changed during the test period, the investment equation was estimated under different time periods, to assess whether the model offered better predictive ability in some periods compared to others. For example, the major tax benefits provided to low income housing essentially began with the Revenue Act of 1978, effective for the most part in 1979-1980, and the Economic Recovery Tax Act of 1981, effective generally after 1980. Therefore, the investment equation was estimated using returns from the post-1978 period, the pre-1981 period, together with the overall test period. In addition, as is explained in Part Two, the model was estimated using rate of return data prior to 1983, given the low level of low income housing investment which occurred during the post-1982 period.

Finally, the data suggests that rates of return are sensitive to assumptions employed in developing the low income housing project. Therefore, the two additional sets of investment returns, (i.e., "low" and "high" tax component returns) were also included in separate investment equations.

Part Two: Estimation of the Investment Relationship

Overview

The rates of return from Part One of the study were compiled and utilized as independent variables in an investment equation, in order to examine the relationship which exists between such returns and actual low income housing investment over a selected period of time. This second phase of the study presents the empirical results of these estimations together with a discussion of their potential implications in reference to the research questions examined in this study.

This section is organized as follows. First, the summary results from the rate of return analysis in the previous section are discussed as they relate to low income housing starts over the test period, in an attempt to reconcile the two measures. Second, a description of the basic investment equations estimated in this part is provided, together with extensions of the basic equations. Third, the statistical methodology utilized, together with the underlying assumptions of the methodology are discussed. Fourth, the estimates of the investment parameters are presented, together with an analysis of the results. The implications of these research results are presented at the end of the chapter.

Analysis

Introduction

The analysis of the rate of return results generated in Part One disclosed questions related to the value of tax incentives provided to low income housing investors during the time period examined. This is especially true when considering low-risk alternative returns available during the same time frame.

Given the Part One results, the expectations regarding the investment effects of tax incentives over the test period and other economic factors examined in the study can be established.

First, it is important to note that privately initiated low income housing development did take place during the test period. The number of housing units started during the test period ranged from a high of almost 53,000 units in the fourth quarter of 1971, to a low of 75 units in the fourth quarter of 1985. Actually, a substantial decrease in low income housing development is noted after 1982, when units started averaged only about 2,000 units per quarter. The number of housing starts for each tax period is detailed in Table 5-7, which follows.

Table 5-7
Number of Housing Starts by Tax Period

<u>Tax Period</u>	<u>No. of Starts</u>	<u>Annual Average</u>
1970-1976	467,073	66,725
1977-1978	87,760	43,880
1979-1980	93,505	46,753
1981:1-2 Qtr.	23,813	29,935
1981:3-4 Qtr.	6,122	29,935
1982-1985	56,287	14,071

At issue is what factors would account for this development? For investment to occur in any period, an expectation by investors of a sufficient economic return had to be present. This expected return could have been a function of direct governmental subsidies (i.e., federal, state and local subsidies), tax incentives (federal, state and local tax incentives) and nontax operating returns. The rate of return analysis discussed in Part One indicated that the rates of return provided by federal tax incentives were relatively low during most of the 1970-1985 time period. This would suggest that the other forms of economic return described above affected the economic behavior of low income housing investors during this period. It also suggests that federal tax incentives, which were relatively low on an individual basis, may have provided investment incentives in the presence of direct subsidies. This study did not consider the investment effects of state and local benefits, and thus the analysis will be applicable to federal subsidies, both direct subsidies and tax incentives.

As previously discussed, the level of direct governmental subsidies provided to the housing programs considered in this study declined substantially during the Reagan administration, while tax incentives showed a dramatic increase during the Reagan years, particularly after the Economic Recovery Tax Act of 1981. This provides an interesting situation for consideration, since the period surrounding the 1981 tax act contains opposite elements of economic return to investors. For example, in 1980 and 1981, the level of direct governmental subsidy was still at a relatively high point compared to later years, while the level of tax incentives was relatively low in 1980, compared to later years. The subsidy data and the average tax component returns for the years surrounding 1981 is detailed below in Table 5-8.

Table 5-8
Comparison of Housing Starts, Direct Subsidy and
Rates of Return

<u>Year</u>	<u>No. of Starts</u>	<u>Direct Subsidy</u>	<u>Tax Component Return</u>
1980	46,965	\$654 million	5.47%
1981	29,935	\$802 million	12.23%
1982	46,185	\$604 million	8.73%
1983	8,291	\$435 million	8.42%

The most significant items from the Table 5-8 data appear to be the large decline in housing starts from 1980 to 1981 and 1982 to 1983, and the subsequent large increase from 1981 to 1982. The interesting fact is that 1981 starts declined over 36 percent, even in the presence of higher direct subsidies and higher tax component returns. However, the tax effect must be discounted somewhat, since the legislation was

enacted during 1981, and thus investors and developers may not have had sufficient time to react to these changes during the 1981 tax year. The large increase in 1982 appears to be a function of the tax changes which occurred in 1981, since direct subsidies showed almost a 25 percent decline from 1981 to 1982. From 1982 to 1983, an 82 percent decline in housing starts occurred, which may be due to several factors. First inflation was at relatively high levels during 1982 and early 1983, which created unusually high mortgage rates during this period. This had a substantial negative effect on the nontax component return in 1982 (i.e., the nontax return during 1982 averaged -5.95 percent). This effect, coupled with the pessimistic attitude which investors probably had regarding the administration's subsidy program for low income housing, may have produced the steep decline in housing starts during 1983. Also, the tax component return during 1982 and 1983 averaged slightly above eight percent, which on a real return basis was not substantial.

From reviewing the number of housing units started in 1984 and 1985, an argument can be made supporting the assertion that tax incentives during the 1982-1985 period were not substantial. The number of units of housing starts declined to 2,193 units in 1984 and 1,398 in 1985. These substantial declines occurred even though tax laws did not change dramatically in the real estate area during these years. Therefore, the declines are due either to the reduced

federal subsidy levels, since these housing programs were effectively phased out by the Reagan administration, or lower state and local incentives provided to low income housing during these years.

To summarize, the above data, although shown in average amounts for the years in question, does indicate that the 1981 tax changes may have produced subsequent investment effects, and that large changes in direct subsidies may have had similar effects. However, the regression analyses performed in the following sections support this assertion only in limited cases.

Investment equations

To estimate the impact of tax changes on investment in low income housing, investment equations were formulated in different functional forms and over different time periods. In addition, separate equations were estimated for the investment returns determined under the two separate assumptions regarding the low income housing project used in the study. A description of these equations is provided in the following two sections.

Basic estimations. The basic investment equation utilized to test the research hypotheses is restated as follows. For purposes of convenience, the time subscripts have been omitted.

$$(1) \text{ LOGSTRTS} = \beta_0 + \beta_1 \text{TXRT} + \beta_2 \text{NTX} + \beta_3 \text{DSUB} + \\ + \beta_4 \text{ALRT} + \beta_5 \text{DSUB} * \text{TXRT} + e$$

This equation is based on the postulated relationship between the number of units of low income housing started during each quarter of the test period and the estimated rate of return on investment, the level of direct governmental subsidy for the particular period and the level of investment returns available from lower risk investments. In the above model specification, the number of housing units started is stated as a function of a dichotomized internal rate of return (i.e., the tax component of the rate of return is considered separately from the non-tax component), together with the level of direct governmental subsidy available for low income housing. An interaction term is included in the model to assess the relationship which may exist between the tax component return and the level of direct governmental subsidy.

The dependent variable, LOGSTRTS, represents the log of the original variable, STRTS. Based on an analysis of the residual plots, starts were transformed by the log function to support the assumption of normality applicable to the error term, which is required under the method of ordinary least squares.

The second primary form of the investment equation estimated is stated as follows:

$$(2) \quad \text{LOGSTRTS} = \beta_0 + \beta_1 \text{IRR} + \beta_2 \text{DSUB} + \beta_3 \text{ALRT} + \\ + \beta_4 \text{DSUB} * \text{IRR} + e$$

This specification examines whether investment in low income housing is better explained by the total rate of return

on investment (IRR), rather than a dichotomized set of returns, as presented in equation (1).

The above two equations were estimated on the basis of (1) the gross level of the tax, nontax and internal rate of return measures, and (2) the return premiums for the tax, nontax and internal rate of return measures, discussed in the previous part of this chapter.

Secondary estimations. The above set of basic equations was also estimated under different time periods (i.e., subsets of the 1970-1985 period) to assess whether the model was more applicable in different years, given that the structure of the returns during the overall test period appeared to change significantly at certain points. A further discussion of these separate time period estimations is provided in the "Other Results" section which follows the primary results.

Finally, the set of equations was estimated under both inflation assumptions, again to assess any differential effects. Given that the zero inflation assumption did not produce substantially different rate of return results, these empirical estimations would not be expected to differ dramatically from the original set.

The results of the estimations of the original two specifications of the two basic investment equations (i.e., nominal basis and return premium basis) are presented below under the section "Primary Results", followed by discussion under "Other Results" of relevant results derived under the

other specifications of the investment equation examined. Preceding these results is a discussion of the tests of certain assumptions related to the test period data.

Tests of assumptions

The test data was analyzed under the method of ordinary least squares, using the SAS statistical package. Given the use of time series data in this study, the SAS AUTOREG procedure was utilized to check for the presence of autocorrelation among the data points. The AUTOREG procedure calculates the degree of autocorrelation present in the data, expressed by the Durbin-Watson value and estimated values of autocorrelation coefficients, and recalculates the regression parameters after controlling for this autocorrelation. The Durbin-Watson statistic is closely related to the sample first-order autocorrelation coefficient of the residuals [Johnson, 1984].

The Durbin-Watson test disclosed that first-order autocorrelation did exist in the data. Using the AUTOREG procedure, this autocorrelation was reduced to a nonsignificant level.

Primary results

Overview. The results of the estimations of the basic investment equations disclosed two primary results. First, contrary to the apparent desires of policy makers, but consistent with the rate of return analysis performed above, no significant investment reaction was detected from the

provision of tax incentives to low income housing investors. Second, also consistent with expectations, a significant negative relationship between tax-free returns and low income housing investment was evident. Limited support was provided for the expected relationship between the level of direct governmental subsidy and low income housing investment. Consistent with expectations, the nontax operating rates of return were found to be nonsignificant in relation to low income housing investment. The results provide limited support for the significance of tax incentives in the presence of direct government subsidies in motivating additional low income housing investment (i.e., the interaction effect).

The research questions were examined through regression of low income housing starts on selected explanatory variables, using a time-series statistical analysis.

Parameter estimates: nominal return basis. The results from the estimation of the first investment equation are presented below in Table 5-9. These results are based on the first inflation assumption employed (i.e., three percent and four percent for income and operating expenses, respectively), using the complete data set for the sixteen year period of the study. In the first section of this analysis, the results of the estimations of the equations based on the nominal values of the tax, nontax and total internal rate of return are presented. The estimations of the same equations on a return premium basis are disclosed in the subsequent section.

Table 5-9
Investment Parameter Estimates
Nominal Basis
Inflation Assumption One
1970-1985

Dependent variable	LOGSTRTS			
Independent <u>VARIABLE</u>	<u>EXPECTED SIGN</u>	<u>COEFFICIENT</u>	<u>t-statistic</u>	<u>PROB >t</u>
TXRT	+	-39.800	-5.910	.0001
NTX	+	-10.785	-4.137	.0001
DSUB	+	- 4.19E-07	-1.573	.1212
ALRT	-	-15.649	-3.181	.0024
TXRT*DSUB	+	4.60E-05	5.930	.0001

In this model, consistent with expectations developed in Part One of this chapter, the tax and nontax variables are shown to be nonsignificant (in a positive direction).⁹ The direct subsidy variable is nonsignificant (in a positive direction), contrary to expectations. The municipal returns variable is significantly negative (.01), which is consistent with the expectation that as returns from a relatively risk-free investment increase, the level of investment level in a risky asset such as low income housing will decrease, since investors are less willing to commit economic resources to such an investment. Finally, the interaction effect between direct subsidies and the tax component return is shown to be significantly positive (.01), suggesting that tax incentives individually were insufficient during the test period to significantly influence investment, but in the presence of

direct subsidies, such incentives did have an investment impact.

In the second formulation, the total internal rate of return is included as an explanatory variable, rather than a dichotomized version as in the above case. Again, the rationale for this estimation is to assess whether investors react to the overall rate of return rather than separate tax and nontax return components. The results, detailed in Table 5-10, are consistent with those above, in that no positive significance is disclosed for the internal rate of return measure. The tax-free return variable is again significantly negative (.03), consistent with the above results. In this formulation, the interaction term is significantly positive (.08), while the direct subsidy variable is nonsignificant, which is consistent with the results from the first case.

Table 5-10
Investment Parameter Estimates
Nominal Basis
Inflation Assumption One
1970-1985

Dependent variable	LOGSTRTS			
Independent				
<u>VARIABLE</u>	<u>EXPECTED SIGN</u>	<u>COEFFICIENT</u>	<u>t-statistic</u>	<u>PROB >t</u>
IRR	+	-22.828	-1.824	.0736
DSUB	+	- 2.58E-06	-1.972	.0537
ALRT	-	-11.717	-2.287	.0261
IRR*DSUB	+	3.17E-05	1.810	.0757

Parameter estimates: return premium basis. In the second part of this regression analysis, the basic investment equation, which incorporates the interaction term, was re-estimated using the return premium concept discussed in Part One of this chapter, whereby the tax and nontax component returns are restated in terms of their excess over the returns available from tax-free, low-risk municipal bond returns. Clearly, given a nonsignificant response to the nominal return specification, no significant response would be expected to the lower return premiums available from low income housing investment. The results, which are presented below in Table 5-11, support this assertion.

Table 5-11
Investment Parameter Estimates
Return Premium Basis
Inflation Assumption One
1970-1985

Dependent variable		LOGSTRTS			
Independent					
<u>VARIABLE</u>	<u>EXPECTED SIGN</u>	<u>COEFFICIENT</u>	<u>t-statistic</u>	<u>PROB >t</u>	
TXRT	+	-46.757	-5.842	.0001	
NTX	+	-10.088	-4.490	.0001	
DSUB	+	2.16E-06	4.692	.0001	
ALRT	-	-38.638	-5.967	.0001	
TXRT*DSUB	+	5.94E-05	5.804	.0001	

The results from this estimation are similar to the first case, except that the direct subsidy variable is shown to be positively significant (.01), which is consistent with

expectations. The tax and nontax component return premiums are again nonsignificant in the positive direction, while the municipal bond return is again significantly negative (.01). The interaction term is significantly positive (.01), which confirms to some extent the results from the first estimation.

The fourth estimation was based on the total internal rate of return, using a return premium basis. Again, given the results disclosed in the first part of this chapter, no significant differences would be expected under this investment scenario. This assertion is confirmed by the results of this estimation, which are presented below in Table 5-12.

Table 5-12
Investment Parameter Estimates
Return Premium Basis
Inflation Assumption One

Dependent variable	LOGSTRTS			
Independent				
<u>VARIABLE</u>	<u>EXPECTED SIGN</u>	<u>COEFFICIENT</u>	<u>t-statistic</u>	<u>PROB >t</u>
IRR	+	- 0.786	-0.436	.6643
DSUB	+	- 2.78E-07	-0.973	.3347
ALRT	-	-11.151	-1.927	.0592
IRR*DSUB	+	- 0.001	-0.350	.7277

As in the case using the gross return measure, the internal rate of return variable under the return premium format is also nonsignificant. The direct subsidy variable and the interaction term are shown to be nonsignificant in this investment relationship, counter to expectations.

Consistent with previous results and with expectations, the municipal bond returns variable is shown to be negatively significant (.06).

Given the results of these first four estimations, it would be helpful at this point to present a brief summary of the preliminary conclusions. First, it is apparent from these results that tax incentives had little investment impact during the time period examined. This was disclosed first by the rate of return analysis and confirmed by the regression analysis. Second, a strong negative relationship appears to exist between investment in low income housing during the test period and returns from tax-free municipal bonds. The results offer limited evidence that tax incentives may have investment effects in the presence of a certain level of direct governmental subsidy. The evidence from the regressions was inconsistent regarding the effect of direct subsidies on actual investment. This effect would appear to be a function of the data and/or model, since in theory, given a low level of tax and nontax incentives available to low income housing, any housing development would be heavily dependent on some form of direct governmental subsidy, either at the state, local or federal level. State and local subsidy data were not included in the study, which may explain in part the lack of results for the direct subsidy variable. Alternatively, it is possible that neither the tax incentives provided to low income housing investors or direct federal subsidies were

individually sufficient to motivate changes in economic behavior, but in combination did provide a level of investment return which impacted investment during the test period.

The section which follows discusses in summary form the results of parameter estimations under other specifications of the investment relationship, and different time periods, the nature of which are described below.

Other results

The basic equations described above were estimated under several different assumptions relating to the investment relationship, level of inflation, and time period. First, to assess the effect of the time period assumption, the basic equations were estimated under two separate time periods. The total test period of 1970-1985 was segregated into the periods 1970-1982 and 1979-1985. The years 1970-1982 were estimated separately since the level of low income housing starts showed a significant decline in the post-1982 years. These low housing start years may have been due to other factors not incorporated in the model, and thus a separate equation was estimated to assess the effect of excluding these years from the analysis. The 1979-1985 period was of interest since the tax changes effective in 1979 and later years produced the most dramatic changes in low income housing investment returns.

To summarize, these results were not substantially different from the previous estimations. During the 1970-1982

time period, the tax component return variable was non-significant, both on a nominal and return premium basis. The direct subsidy variable was significantly positive (.11) under the return premium specification, but not the nominal return specification. The municipal bonds return variable was also significant under the return premium specification (.01) and the nominal return specification, although to a lesser degree (.11). The interaction term was significant (.03) under the return premium specification, but not the nominal specification. These results are basically comparable to the previously obtained results.

The results from the above equation applied to the 1979-1985 time period are also consistent with previous results for the entire period of the study. Again, the tax and nontax component returns are not positively significant, which confirms earlier assertions developed from the rate of return analysis. The direct subsidy variable and the municipal bond return variable are significant in the expected directions (.01). The interaction term is again significantly positive, which is consistent with the results derived from the return premium estimations over the 1970-1985 time period.

Overall, the estimations under differing time periods did not produce substantially different results than the 1970-1985 time period, suggesting that the use of this period was not a limiting factor in the study.

As a further extension, the same basic investment equation was also estimated under the zero inflation assumption applicable to operating income and expenses. As the rate of return analysis disclosed, the expectations regarding the regression parameters would not be expected to differ radically under this assumption, which is borne out by the results. The tax and nontax variables are nonsignificant in the positive direction, while the parameter estimates for the level of direct subsidy, the municipal bond return variable and the interaction term are all significant in the expected direction, as in the positive inflation case. This result does illustrate that the inflation assumption also does not appear to be a limiting factor in the study, given that consistent results were obtained in both cases.

Estimations Under Other Project Assumptions

The final part of this study involved the estimation of the investment parameters under the two additional sets of assumptions described previously in Part One of the study. The rate of return analysis disclosed that the returns were sensitive to changes in the investment project assumptions, which necessitated the estimation of the effects of these returns on investment. The results of these estimations are presented in Tables 5-13 (high return case) and 5-14 (low return case), which follows.

Table 5-13
Investment Parameter Estimates
High Tax Component Return Assumptions
Nominal Basis
1970-1985

Dependent variable		LOGSTRTS			
Independent					
<u>VARIABLE</u>	<u>EXPECTED SIGN</u>	<u>COEFFICIENT</u>	<u>t-statistic</u>	<u>PROB >t</u>	
TXRT	+	4.137	0.266	.7916	
NTX	+	0.461	0.321	.7492	
DSUB	+	-1.26E-08	-0.012	.9904	
ALRT	-	-11.834	-2.314	.0245	
TXRT*DSUB	+	- 5.00E-06	-0.267	.7904	

The above results based on the high tax return component offer little additional evidence to that previously developed. The tax component return is again nonsignificant, although the coefficient is in this case positive. The nontax component return, level of direct subsidy, and the interaction effect between the tax component return and direct subsidy are all nonsignificant. The tax free bond return is significantly negative, which is consistent with previous cases.

Table 5-14
 Investment Parameter Estimates
 Low Tax Component Return Assumptions
 Nominal Basis
 1970-1985

Dependent variable		LOGSTRTS		
Independent				
<u>VARIABLE</u>	<u>EXPECTED SIGN</u>	<u>COEFFICIENT</u>	<u>t-statistic</u>	<u>PROB >t</u>
TXRT	+	84.216	3.628	.0006
NTX	+	-5.024	-1.117	.2690
DSUB	+	4.58E-06	3.315	.0016
ALRT	-	-12.787	-2.071	.0431
TXRT*DSUB	+	- 1.16E-04	-3.602	.0007

The estimation of investment parameters under the low tax component return assumption produces substantially different results than the previous two sets of assumptions. First, the tax component return under the low tax component return assumption is significantly positive (.01), as is the level of direct governmental subsidy (.01). Both of these results are consistent with a priori expectations. Consistent with prior estimations, the tax-free rate of return is significantly negative (.05). The interaction term in this case is nonsignificant (in the positive direction).

Given these results, and those from the prior cases, what inferences can be made? Depending on the assumptions adopted related to the low income housing project, the effects of tax incentives on low income housing investment were shown to be significantly positive (low return case), significantly

negative (original case) and nonsignificant (high return case). The problem faced in the interpretation of these conflicting results is that in the actual real estate market, no single set of housing project assumptions exist. It is difficult to explain the reaction to the low rates of return, particularly given the negative real returns which existed during most of the test period. Investors' decisions should not have been significantly influenced by the presence of low nominal tax component returns, which on a real return basis would be negative. The nonsignificance disclosed by the high return equation and the original equations appears more defensible in terms of basic economic logic.

Given the conflicting evidence provided by the above equation estimates, a definitive statement regarding the investment effects of tax changes cannot be made. However, given that no significant positive investment reaction occurred in the presence of high or average tax rates of return, the evidence would appear stronger that tax changes did not produce a significant investment effect during the period in question.

Research Implications

The success of tax policy initiatives developed by Congress is predicated on the reaction of taxpayers to such initiatives in the desired direction. Without such reaction, the conclusion can be drawn that either the incentive was insufficient in total to alter investor behavior, or

countervailing economic conditions mitigated the value of the incentive. In this study, the reaction of taxpayers to low income housing tax incentives was examined over a representative period of time when such incentives were available in some form to low income housing investors. The results in most cases indicate a lack of significant response by taxpayers to these incentives. This result presents several important policy implications.

First, a nonsignificant tax component return measure is clearly contrary to the expectations of Congress in drafting tax legislation supporting low income housing, particularly in the latter 1970's and 1980's, during which time the level of direct government subsidy for low income housing showed substantial declines. Tax incentives in these years by design occupied a more important role in terms of subsidy vehicles for low income housing development. However, the data developed in this study did not offer strong evidence to support the tax incentive hypothesis.

The data did suggest that tax incentives for low income housing were significant to investors only in the presence of direct subsidies. This effect suggests that the intended role of tax incentives as an investment stimulus is in question. Although Congress has not clearly defined this role, it is apparent that tax incentives were expected to occupy a prominent position in the support of low income housing development,¹⁰ given the cuts in direct subsidies for low

income housing, and the massive reorganization of tax preferences for real estate, including low income housing, which took place in the Economic Recovery Tax Act of 1981. The results of this study do not offer strong support for this policy.

Summary of Research Questions

This study examined three questions. The answers to these questions, as indicated by the data developed in this study, are summarized as follows:

1. Over the period 1970-1985, what is the effect of federal tax incentives on multifamily, low income housing starts?

The results of the study indicated that tax incentives had no significant effect on the number of units of low income housing started during the test period under two of the three project assumptions examined. The coefficient for the tax component return variable, which in theory should be positive if tax incentives positively influence low income housing starts, was shown to be nonsignificant (in the hypothesized direction) in two of the three cases tested.

Also, the results disclosed that the number of low income housing units started was not significantly related to the total internal rate of return available from the housing investment, which is consistent with the above results.

2. Over the period 1970-1985, what is the economic relationship between federal tax incentives for low

income housing and direct subsidies for low income housing?

The results of the study offer limited evidence that tax incentives positively affected investment behavior during the test period in the presence of direct governmental subsidies for low income housing.

3. Over the period 1970-1985, what is the economic relationship between returns available on a low-risk asset and investment in low income housing?

The results of the study strongly suggest that a negative relationship existed between the number of low income housing units started during the test period and the rate of return available on tax-free municipal bonds, consistent with prior expectations.

Interpretation of Research Results

A review of the above research results generates the question of why tax incentives did not produce a significant investment impact during the test period? Several explanations are possible.

First, it is possible that tax incentives were not sufficient in magnitude to motivate changes in the investment decisions of real estate investors during the time period examined in the study. Tax incentives represent only one component of the overall return on investment, and although such incentives may be the dominant form in a relative sense,

their magnitude may have been insufficient over the test period to alter investor behavior.

Second, the relative level of tax incentives, in comparison to other competing economic returns, may have been insufficient in the minds of investors to alter their investment behavior. Economic theory would suggest that investment decisions of rational investors are a function of all relevant economic and noneconomic information available to investors at the decision date. In the case of low income housing investment decisions, such information would include the availability of tax incentives, direct governmental subsidies, and investment returns available in alternative markets. This argument is supported to some degree in this study by the disclosed significance of the alternative return variable and the direct subsidy variable.

Third, investors may not attach significance to tax changes in their investment decisions due to the inherent uncertainty surrounding future tax law changes which might affect their investment. Tax laws affecting real property have changed numerous times during the 1970's and 1980's, thus adding to the uncertainty of investors. This factor, together with uncertainty related to the taxpayers' future tax situations, may have produced a sufficient level of "tax risk" such that investors were reluctant to capitalize the value of tax changes in their expected investment return.

Fourth, the tax law changes which occurred during the test period affected many forms of investment property, including investments in competition with low income housing. These competing investments may have been positively affected by the tax changes to the degree that this effect dominated the additional tax incentives provided to low income housing.

Limitations of the Research

As previously discussed, the two primary limitations present in this study are (1) the use of certain assumptions in development of the rate of return model which may not mirror all investment situations and (2) the potential omission of relevant economic variables from the investment model which may affect investor behavior. The difficulty is that these two problems are not easily correctable in such a study.

In the construction of any economic model, certain assumptions are required which limit the model's applicability in terms of the total population of interest. It would be infeasible to design such a model to incorporate all potential population groups, especially in a market such as real estate where the underlying investor group is heterogeneous and not well defined. In constructing the rate of return model used in this study, an attempt was made to address the characteristics of an investor group which would under expectations be a dominant investor in low income housing projects. In addition, two additional sets of assumptions

were included to estimate returns at each end of the spectrum of potential returns. However, this does not imply that other investors with different characteristics do not also invest in low income housing. To the extent that the rate of return measures do not reflect these investors, the results may be biased.

Second, the specification of an economic model of human behavior is at best a rough estimate, since many variables affect investment decisions. The variables examined in this study would be expected to account for much of the variance in low income housing investment decisions, but the exact form of these variables, as they affect investment decisions, is difficult to specify.

Notes

1. Inflation Assumption 1 [Rental Income: 3%, Operating Expenses: 4%].
2. The change in the maximum tax rate from 70 percent to 50 percent was actually effective on January 1, 1982. However, special treatment was allowed for capital gains. For such gains, the lower tax rate was effective on June 19, 1981.
3. It is important to note once again that the low income housing investment returns calculated in this study only include tax benefits from federal sources. Tax benefits may also be provided on a state or local level which affect the tax component return. To the extent that such benefits exist, the returns in this study are understated.
4. Inflation Assumption 1 [Rental Income: 3%, Operating Expenses: 4%].
5. Inflation Assumption 2 [Rental Income: 0%, Operating Expenses: 0%].
6. Inflation Assumption 2 [Rental Income: 0%, Operating Expenses: 0%].
7. Inflation Assumption 1 [Rental Income: 3%, Operating Expenses: 4%].
8. Inflation Assumption 1 [Rental Income: 3%, Operating Expenses: 4%].
9. The significant negative results for the tax and nontax return components in this and other estimations are clearly anomalous. It is difficult to imagine any scenario in which positive investment returns could have a negative effect on actual investment.
10. The Economic Recovery Tax Act of 1981 enacted provisions favorable to most forms of real property investment. Low income housing received relatively more favorable cost recovery provisions. The Tax Reform Act of 1986 eliminated most of these favorable real property investment incentives, other than a tax credit for low income housing.

CHAPTER VI SUMMARY AND CONCLUSION

The United States Congress has consistently utilized the income tax system as one means to influence the behavior of taxpayers in support of certain socially desirable economic activities. During the 1970s and 1980s, one major economic activity supported by the income tax system was the provision of housing to low income individuals. Income tax provisions were enacted by Congress in the 1970s and 1980s which increased the expected return to investors through relatively favorable tax treatment of certain investment costs, gains and losses.

The presumption supporting these tax provisions was that investors would react to the expectation of higher economic returns by engaging in the development of additional low income housing.

This study has examined the effect of the provision of tax incentives for investment in privately developed, low income, multifamily housing, over the period 1970-1985. During this period, several different tax laws were enacted which affected rates of return from low income housing.

The results of the study in general do not support the apparent assumption of policy makers that tax incentives

significantly affected the production of low income housing over this time period. No significant association was detected between changes in tax incentives for selected low income housing programs and the number of units of low income housing started during the test period. Limited evidence was available to support a significant relationship between changes in tax incentives and housing starts, in the presence of direct governmental subsidies.

There may be several explanations for this lack of significant reaction to low income housing tax incentives which should be considered by policymakers in future legislation. First, tax incentives may not be the optimal form of economic subsidy to influence the behavior of investors. The reason for this is twofold. First, a tax incentive, although budgetarily equivalent to a direct cash subsidy, may not be perceived as such by potential investors in the tax subsidized activity. This is due primarily to the inherent long-term uncertainty surrounding the value of a tax incentive, as compared to a direct cash payment, since the tax laws have been frequently changed by Congress. This introduces the potential of tax rate and tax base risk into the decision process of investors by the prospect of future tax law changes affecting the return on their economic investments. Thus, faced with the alternative of potentially uncertain future tax incentives or alternative investments providing a lower, but less risky return, taxpayers may elect

the latter. The results of study disclosed a significant effect on the number of low income housing units started from the return available on a relatively risk-free investment, tax-free municipal bonds, indicating that alternative investments offering less risky returns are clearly a factor in the investment decision.

Second, to be realized as an economic benefit by taxpayers, tax incentives must offer the prospect of reduced tax liability over the years of the project's life. Potential investors may be uncertain regarding their future tax positions, and thus may discount the value of future tax savings offered by tax incentives.

The results of this study suggest that Congress should consider a reassessment of its tax policy in the area of low income housing. Tax incentives as designed by Congress do not appear to motivate significant changes in the economic behavior of taxpayers relating to the development of low income housing.

Given the results of this study, there appear to be three important issues which should be addressed by Congress. First, if tax policy is the desired mechanism to motivate additional housing construction, the magnitude of tax incentives for low income housing investors must be such that they provide sufficient risk-adjusted returns to motivate new investment. The total effect of tax incentives available to low income housing under the current tax law (TRA86) cannot

be assessed until the law has been in place for a certain period of time. However, there is some question as to whether this law provides sufficient investment incentives to low income housing investors, given other changes in the law which indirectly impact low income housing (e.g., change in tax rates and capital gains provisions), and certain restrictions (e.g., tax exempt financing) imposed on low income housing investors.

Second, the target investor group must be more narrowly defined in the policy development process. Under the 1986 Act, favorable tax provisions available to investors in low income housing are phased out for those taxpayers with adjusted gross incomes above a specified level, which appears inconsistent with the goal of producing additional housing for low income individuals through the tax laws. The restriction of the low income housing tax preferences to middle income individuals lessens the base of potential investment dollars available for low income housing. Such inconsistency must be resolved.

Third, Congress must act to reduce the uncertainty related to investments supported by the income tax code. To facilitate taxpayer planning, provisions must be in place which will allow more consistent tax treatment over the useful life of the supported activity. This means that future tax law changes should not affect the tax treatment of subsidized activities until certain restricted actions occur related to

the investment. This will facilitate long-term planning related to tax supported investments. This will not eliminate tax risk, since it is a function of other factors than potential tax law changes, but it may improve taxpayer perception of the value of tax benefits.

Finally, Congress must pursue further research related to optimally subsidizing socially desirable activities such as low income housing. The apparent lack of relationship between tax incentives and low income housing investment suggest the necessity of further research to identify the actual and perceived value of tax incentives in the investment decision process. Clearly, other economic and behavioral factors may interact with the availability of tax incentives to limit or negate their actual value in motivating new investment. Given the historical propensity of Congress to utilize tax incentives as a policy tool, such research should be a first priority.

Some have suggested that the tax laws are not the best means to promote private investment in these areas. Clearly, additional empirical research in this area is required to reduce this tax/direct subsidy controversy regarding the optimal production of low income housing. Ideally, such research could isolate the factors which motivate investors to alter their economic behavior in response to tax changes. Given the complexity of a dynamic economy, this determination would be a difficult task. A possibility exists for some form

of economic laboratory study, to examine the behavior of taxpayers in the presence of competing economic investments of varying risk levels.

In any event, given the apparent shortage of adequate housing for low income individuals, the total housing policy currently in place must be carefully analyzed for purposes of modification, in order to pursue the optimal means of producing such housing.

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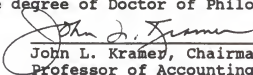
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Biographical Sketch

Alan Bruce Clements was born in Jacksonville, Florida on February 12, 1954. He graduated from the University of Florida in 1977 with a B.S. in accounting. He was employed by Chevron U.S.A. as a financial accountant from 1977-1979 in Walnut Creek, California, and by the Office of the Auditor General: State of Florida from 1979-1980. He received the CPA certificate in 1980. He entered the graduate business program at the University of Florida in 1980 and graduated in 1982 with an M.B.A. He was employed with Deloitte Haskins + Sells, C.P.A., from 1982-1984. In August, 1984, he entered the doctoral program in accounting at the University of Florida.

He is married to Jane Liddell Clements and has three children, Kristen, Lauren, and Alan.

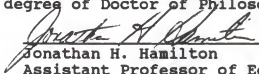
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John L. Kramer, Chairman
Professor of Accounting

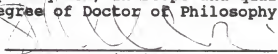
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Sandra S. Kramer
Associate Professor of Accounting

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.


Jonathan H. Hamilton
Assistant Professor of Economics

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.


Steven J. Willis
Professor of Taxation

This dissertation was submitted to the Graduate Faculty of the Fisher School of Accounting in the College of Business Administration and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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Dean, Graduate School